

Scottish Public Health Network (ScotPHN)

**Scottish Collaboration for Public Health Research
and Policy (SCPHRP)**

**Landscape Review of the Research on Obesity in
Scotland**

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LANDSCAPE REVIEW OF THE RESEARCH ON OBESITY IN SCOTLAND

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OVERVIEW

The aim of this landscape review is to provide a comprehensive and coherent description of completed, current and planned research on obesity in the Scottish population. It will also identify important research gaps, as well as potential collaboration opportunities that could help move Scotland's obesity research agenda forward in a more progressive, strategic and joined up way. While Scotland currently has a comprehensive set of evidence-based guidelines for the treatment of obesity in clinical settings (SIGN115), it should be noted that the focus of this review is on mapping current research, rather than evaluating current practice.

Data on relevant research projects were collected via electronic searches of relevant databases and the internet, supplemented by email and telephone communication with relevant researchers. The data collection period lasted from January until March 2015.

Inclusion criteria for studies

- Undertaken or published in the last 10 years or are currently planned or underway in Scotland
- Primary or secondary focus on overweight/obesity
- Intervention studies must have included an outcome evaluation, with at least one outcome related to obesity/overweight.

Exclusion criteria for studies

- Had been undertaken by researchers in Scotland but the study population was residing outside Scotland
- More than 10 years old when the study was published (would have been reported in the Obesity Route Map [ORM])

Intervention studies which focused on one of the determinants of health (e.g. food or physical activity), but did *not* have any measure of weight were also excluded. This is because it is not possible to determine whether the intervention would actually have an impact on weight. For example, an active travel project may increase levels of physical activity, but may not have an effect on body weight. Without linking the activity with body weight outcomes, it is not possible to attribute causality. We appreciate that there is a large volume of evidence and research undertaken on both physical activity and food, but they may lack key components of an effective intervention for weight prevention or reduction (e.g. they may be reaching a population which is already active/eating well, or some of the population may be compensating in other behaviours such as eating more or exercising less).

Research projects and their associated published papers were coded in Excel for a range of variables including: study design, geographical area, funding source, participant characteristics (e.g. weight status, age group, socio-demographics, co-morbidity), ORM pillar and type of intervention. A full list of the codes can be found in Appendix 1. Coding for some variables was based on the definitions provided in the research publication. For example, weight status of the participants was coded according to the study researchers' definitions of overweight or obese, as the very small discrepancy between clinical and epidemiological cut-offs for BMI did not warrant separate coding. Similarly if a paper defined a research population as socio-economically deprived, we coded it as such.

In total, 180 individual studies were included in the review which generated 217 total publications (some studies had several associated publications). Of the 180 studies, the majority employed epidemiological designs such as cross-sectional, case control and cohort. These studies primarily focused on describing the Scottish population in terms of the prevalence of obesity, or the

relationship between obesity and other factors such as diabetes, pregnancy and heart disease. Fifteen percent of the identified studies were qualitative in nature and focused on people's understandings of obesity. Eighteen percent were other study types (e.g case series, mixed methods). Just over a quarter of the individual studies were evaluated interventions, the majority of which focused on treating people who were obese or overweight rather than preventing obesity or maintaining healthy weight in the general population.

DESCRIPTION OF INTERVENTION CHARACTERISTICS

This section provides a brief overview of the 47 intervention studies included in this report, with a description of the types of interventions implemented, participant characteristics, and the settings used for the delivery of interventions. A detailed characteristics table for these intervention studies is provided in Appendix 2.

Types of interventions

The majority of included interventions used single-focus approaches to weight management (n=33, 70%). Of these, diet-based interventions were the most common (n=10). Pharmacological or surgical interventions were used in 9 studies, while physical activity alone was used in 2 interventions. The remaining 12 single-focus approaches provided participants with advice, education, counselling, health checks or video consultations.

Fourteen studies delivered more complex interventions, the components of which varied widely, most commonly offering lifestyle advice with a focus on diet or physical activity/education. Four of these studies employed technologies such as pedometers, apps, web-based programmes and text messaging and tele-nutrition, while five of the complex interventions included educational interviewing or cognitive behavioural therapy combined with low calorie diets.

Participants

Most intervention studies included both males and females (n=31, 66%), while those that were gender-specific usually targeted women. Twice as many studies were designed for females (n=11) compared males only (n=5).

A number of interventions targeted other specific socio-demographic groups, including children and pregnant or postnatal women. While the well-known PODOSA trial has focused on a particular ethnic minority (Southeast Asian individuals), and one other study was developed for individuals with intellectual disabilities, there is a notable dearth of intervention research in Scotland focused on ethnic minorities, on later life, and those with disabilities.

Most interventions focused on treating individuals who are already overweight, obese, or morbidly obese (n=32) while fewer (n=15) focused on primary prevention in the general population.

Co-morbidities

Relatively few of the interventions (6 out of 47) focused on co-morbid populations. Two were designed for participants with cardiovascular problems in addition to weight management issues. One study focused on participants who were either diabetic (Type 2) or at risk of Type 2 diabetes in addition to weight management issues, and four further studies included participants with unspecified co-morbidities.

Intervention Settings

The most common setting for delivering an intervention was a health services clinical setting, where 53% (n=25) of the interventions took place. Community settings were also used for the delivery of many interventions, totalling 36% of the studies (n=17). A further five (10%) were delivered in a school setting, while only one included a workplace setting.

Some interventions had a multi-setting approach. For example, the Counterweight programme was delivered in both health service and community settings. In addition the KeepWell programme was delivered in a combination of workplace, health care and community settings.

INTERVENTION STUDIES	
Weight Status	
General population	15
Overweight, not obese	5
Overweight & obese	5
Obese	20
Morbidly obese	4
Socio-demographics	
Pregnant/postnatal	4
Children	10
Adult female	10
Adult male	5
Adult (both genders)	34
Later life (pensionable age)	2
Ethnic minority	1
Low SES	4

Table 1

DESCRIPTIVE OBESITY RESEARCH

Approximately half (n=110 studies) of the obesity-related research identified in this review was descriptive/observational in nature, which encompassed a number of study designs (namely cross-sectional studies, case-control studies, prospective/retrospective cohort studies, ecological studies and time-series studies). Seventy percent of the descriptive studies conducted secondary analysis of existing datasets (n=77), while the remaining 30% collected primary data (n= 33). A list of datasets utilised for obesity-related data analysis can be found in Appendix 3.

The descriptive research landscape ranged from studies which described trends in obesity prevalence within the general population (approximately three quarters of the studies), to the remaining quarter of research which specifically focused on the nature of obesity amongst populations with other co-morbidities and risk factors such as diabetes, cardiovascular disease, smoking/alcohol use and depression. A number of studies focused on health behaviours such as physical activity and dietary habits in relation to obesity prevalence, or engagement in such behaviours by obese populations (n=19). A considerable amount of research has been conducted on specific population groups throughout the lifecourse (Table 2), with a particular focus applied to maternal/postpartum overweight and obesity (n=16). Observational research studies which included outcomes relating to health inequalities and/or socioeconomic position in relation to overweight and obesity totalled 21.

OBSERVATIONAL STUDIES	
Weight Status	
General population	90
Overweight, not obese	1
Overweight & obese	2
Obese	15
Morbidly obese	2
Socio-demographics	
Pregnant/postnatal	16
Children	29
Adult female	18
Adult male	1
Adult (both genders)	91
Later life (pensionable age)	4
Ethnic minority	1
Low SES	9

Table 2

QUALITATIVE OBESITY RESEARCH

Qualitative studies accounted for approximately 15% of all the obesity-related research identified in this review (n=34). Of these 34 studies, approximately two thirds (n=22) were independent research projects while the remaining third (n=12) were linked to an intervention study. Studies linked to interventions primarily investigated whether the components of the intervention were working as intended based on participant's views and perceptions, or whether any issues were affecting participation or progress in the intervention that had not previously been considered. Independent studies explored a broader range of research questions in relation to overweight and obesity. Topics ranged considerably, with the majority of the research focusing on either parent's experiences or perceptions of their child's weight, perceived barriers and facilitators to obesity-promoting and/or preventative behaviours or participant's perceptions of weight and health. The qualitative research landscape included studies conducted on specific population groups throughout the life course, detailed in Table 3.

QUALITATIVE STUDIES	
Socio-demographics	
Pregnant/postnatal	7
Children	4
Adult female	12
Adult male	2
Adult (both genders)	20
Later life (pensionable age)	1
Ethnic minority	1
Low SES	1

Table 3

DISCUSSION

This landscape review has described the areas in which research has been undertaken in Scotland in the last decade. The observational/descriptive obesity research identified in this review is substantial and shows that surveillance and monitoring of trends/associations relating to obesity has been adequate within the last decade in Scotland. This finding demonstrates that observational research plays a crucial role in enhancing our understanding of obesity. However, it may be time to move on from the observational research to find long-term solutions in the form of sustainable and evidence-based interventions. The importance of qualitative research for helping us move forward

with this intervention-based research agenda should not be underplayed. The qualitative research identified in this review can greatly enhance our understanding of how and why obesity and the obesogenic environment impacts on the lives of people in Scotland. These understandings are vital if we are to develop acceptable and relevant solutions that can fit within the context and culture of people's everyday lives.

There are a number of striking findings from this review that need to be considered within the policy and practice arena. First there is a relatively small amount of research that has focused on *preventing* obesity compared to the amount of research that has focused on reducing or maintaining weight in people who are already obese or overweight. There are several explanations for this. First, it is much easier to 'see' an effect of interventions to reduce weight gain than to see an effect of interventions to prevent weight gain in the first place (which may take several years to show an effect). Second, many interventions currently in place that might indeed prevent weight gain (e.g. active travel plans, healthy food policies, innovative community projects) have not been evaluated specifically to ascertain their effect on weight-related outcomes. An assumption is often made that increasing healthy eating or physical activity will result in healthy weight maintenance, but these assumptions may be flawed, and need to be tested. Third, the research and policy agendas are not necessarily in alignment; the academic research community often focuses on a specific topic within a specialty discipline (e.g. diet, physical activity, diabetes, coronary heart disease) in order to build up reputations and expertise in specific areas, rather than focusing research on policy or population priorities.

The second striking finding is the amount of research that focuses on one particular cause of obesity (e.g. diet or physical activity) rather than taking into account the multiple causes and pathways. Many of the interventions were delivered at the individual level and focused on reducing weight rather than looking at the range of factors that impact on obesity.

Additionally, while a significant proportion of observational studies have examined obesity-related factors between different socioeconomic groups, very few interventions have focused exclusively on tackling obesity amongst low-SES populations, despite being conducted in areas with a high proportion of socioeconomically-disadvantaged residents (e.g. parts of Glasgow). The distinct lack of workplace-based interventions in comparison to those which are health service-based or community-based should also not be overlooked. It appears that workplace-based initiatives to manage weight are not as common in Scotland as they are in other countries such as the United States and the Netherlands. This is a practice which may merit reconsideration given that situating weight management interventions in the workplace has been highlighted as a useful way of accessing and engaging with a population of individuals (workers) that remains reasonably stable over time. In addition, it appears that interventions which exclusively target older individuals and adult males are lacking in comparison to interventions involving other socio-demographic sub-groups. This is likely to be reflective of continuing difficulties in engaging adult men and older people with weight management interventions. This is the case despite the fact that more men than women are overweight or obese in the UK based on BMI (a difference that is projected to continue), and that older people may suffer the most immediate health consequences of obesity.

The third striking factor was the focus on individual approaches to the prevention or treatment of obesity rather than environmental, legislative, policy or cultural approaches. In terms of research and evaluation, these are definitely more challenging to develop and evaluate, but are likely to provide more consistent results and reach those who may derive most benefit.

The last striking factor was the almost complete absence of research to evaluate what is already going on in Scotland in terms of innovative and potentially effective policies and practices. There are many projects (and policies) being developed and delivered in Scotland. Many of them are highly innovative and developed at a grass roots level which increases their chance of success. Researchers all too commonly think that they need to develop their own interventions rather work with practitioners and policy makers to evaluate what is happening in their own community.

There are limitations to this review. Although we made every effort to identify published and unpublished research in Scotland, it is likely that we will not have captured every piece of research. This review was carried out on a tight timescale, and although we are confident that we have captured over 90% of the research, we may have missed some of the smaller unpublished work, or research published as masters or other types of research projects. However, we are confident that our findings and conclusions are robust and would not change if this extra research was added to the database.

CONCLUSIONS

This research landscape review has revealed a buoyant research community and priorities, which are focused on the obesity agenda. However, studies tend to focus on specific areas and populations groups which fulfil an academic research agenda rather than an agenda that is required for Scotland to truly move forward in achieving significant reductions in obesity. The number and calibre of researchers in Scotland who can potentially contribute to the policy agenda is impressive, but many are currently working within their own academic silos and not collaborating with each other to develop multidisciplinary research. They are also not working with those people who are actually responsible for developing or delivering policies and practices which contribute to the obesity agenda – creating such collaborations could revolutionise our knowledge of what works, for whom and why. A more strategic, collaborative approach to research is needed in order for it to address and hopefully reduce the prevalence of obesity and its associated co-morbidities in Scotland.

RECOMMENDATIONS

From the analysis of the research currently carried out in Scotland, we have the following recommendations:

- 1) Funding bodies should develop a strategic approach to research which ensures that the work that is funded is relevant to the Scottish population and focuses on issues such as a) preventing the development of obesity; b) approaches other than those at an individual level (e.g. environmental, governance); and c) evaluating current policies and practices which show promise
- 2) Academics and practitioners in obesity research and practice should work more closely with each other through the formation of networks and collaborations which may result in conferences, seminars, and best practice events.
- 3) Research should focus on those who have the potential to benefit most – these are often those from the most economically disadvantaged communities but may also include other population groups such as pregnant women.

Appendix 1: Coding manual for Landscape Obesity Review

CATEGORY	CODE	DEFINITION
Nature of Study		
	1	Observational
	2	Experimental
	3	Qualitative
	4	Protocol/ baseline/mid-study report
	5	Other
Study Status		
	1	Complete
	2	Ongoing
	3	Planned
	9	Unknown
Intervention?		
	Yes	Yes
	No	No
Evaluated?		<i>Applicable to interventions only</i>
	Yes	Yes
	No	No
	N/A	Not applicable
Study design		
	1	Mixed methods
	2	Qualitative
	3	RCT
	4	Cohort
	5	Cross-sectional
	6	Case-control
	7	Feasibility
	8	Other
	9	Unknown
Main study?		<i>Applicable to interventions only</i>
	1	Main [intervention] study
	2	Sub-study
	8	Not applicable
Participant weight status		
	1	General population
	2	Overweight but not obese stated in paper or defined as ($\geq 25 - 30$)
	3	Overweight and obese stated in paper (e.g. >25)
	4	Obese stated in paper or participants described as BMI ≥ 30 kg/m ²
	5	Morbidly obese stated in paper or participants described as ≥ 40 kg/m ²
	8	Not applicable (e.g. interviews of health professionals)
	9	Not stated/not known missing

Appendix 1: Coding manual for Landscape Obesity Review

Co-morbidity/ condition/risk factors		<i>Study focuses on people with a specific co-morbidity, risk factor or condition</i>
	1	None stated
	2	With a co-morbidity (any)
	3	Diabetes or risk factors for diabetes
	4	Smoker or alcohol
	5	Cardiovascular
	6	Part of screening programme/cancer related
	7	Other (e.g. PCOS)
	8	not applicable (e.g. participants were health professionals)
	9	Not stated/not known/missing
Angelo Environment		
	1	Physical: The physical environment, in the sense is what is available: includes not only the visible world but availability of training materials, nutrition and exercise expertise, technological innovations and information Food: availability, labelling, training, reduced fat products
	2	Economic: costs of food and physical activity. Includes monetary costs and also improved public transport
	3	Political: includes laws, regulations, institutional rules, food industry standards
	4	Socio-cultural: community or societies attitudes and beliefs, cultural norms, e.g. health promoting schools, role models, mass media and advertising
	5	Other (e.g. clinical setting, or trials of medications)
	8	Not applicable
	9	Not known/missing
Angelo Scale		
	1	Macro-level
	2	Micro-level
	8	Not applicable
	9	Not known/missing
Angelo Focus		
	1	Physical activity only
	2	Diet only
	3	Both or 'Lifestyle'
	4	Clinical interventions (drugs, surgery)
	8	Not applicable
	9	Not known/missing
Areas for Action		
	1	Prevention of weight gain in both those of normal weight and those currently overweight through changes in culture and environment
	2	Reduction in weight in those currently overweight and obese
	3	[Management] and prevention of adverse complications in those who are currently obese. Includes any interventions undertaken in secondary care, or drug/surgery
	8	Not applicable
	9	Not known/missing

Appendix 1: Coding manual for Landscape Obesity Review

Setting		
	1	School
	2	Workplace
	3	Health service
	4	Community
	8	Not applicable
	9	Not known/missing
Targeted gender		
	1	Male
	2	Female
	3	Male and female
Targeted socio-demographics		
	1	Ethnic minority
	2	SES (low)
	3	Children
	4	Later life (>= pensionable)
	5	Pregnant and/or postnatal women
	6	People with intellectual disabilities
	8	Not applicable
	9	Not known/missing
Route Map (ORM) pillar		
	1	Energy consumption
	2	Energy expenditure
	3	Early years
	4	Working lives
	8	Not applicable
	9	Not known/missing
Type of intervention		
	<i>freetext</i>	ie. use of technology, counselling, etc

Appendix 2: Intervention Studies

		<i>*See Appendix 1 Codebook for coding definitions</i>			Description of interventions (ANGELO)		
Study ID	Study name	Methods	Participants	Environment	Scale	Focus	
ABC	Randomised Controlled Feasibility Trial of an Evidence-Informed Behavioural Intervention for Obese Adults with Additional Risk Factors	4	4	1	2	3	
Abo'ouf et al	NHS Family-based Paediatric Weight Management Programme: How to Improve Retention? 	1	4	1	2	3	
Active Choices	Prevalence of severe obesity in Glasgow schoolchildren and the impact of a school based intervention	1	5	1	2	3	
ActWELL	Breast cancer risk reduction - is it feasible to initiate a randomised controlled trial of a lifestyle intervention programme (ActWell) within a national breast screening programme?	4	2	1	2	3	
ALLCHANGE	ALLCHANGE: an exploratory trial of lifestyle interventions in Scottish schoolchildren	4	1	1	2	3	
Astrup et al	Effects of liraglutide in the treatment of obesity: a randomised, double-blind, placebo-controlled study	2	4	5	2	4	
B'Active	The B'Active programme for overweight primary school children in Glasgow: determining the prevalence of overweight and obesity and piloting an activity intervention	1	2	1	2	2	
Bermano et al	Selenium (Se) supplementation and High Intensity Interval Training (HIIT) as an alternative strategy for cardiovascular disease prevention in overweight/obese individuals	2	1,2	5	1	1	
BeWEL	The impact of a bodyweight and physical activity intervention (BeWEL) initiated through a national colorectal cancer screening programme: randomised controlled trial	2	3	1	2	3	
BRIGHT	A randomised feasibility trial of Weight Watchers groups with additional dietetic support compared to Weight Watchers groups only in women treated for breast cancer: The BReast cancer healthy weiGHT (BRIGHT) study	4	2	1	2	3	
Child Healthy Weight	Evaluation of the Child Healthy Weight Programme: Final Report	5	3	3	2	3	
Counterweight	A community pharmacy weight management programme: an evaluation of effectiveness	2	4	1	2	1	
CPET	Children, parents and pets exercising together (CPET): exploratory randomised controlled trial	2	1	4	2	1	
DiRECT	Reversal of type 2 diabetes mellitus (T2DM) using non-surgical weight management with Low-Energy-Liquid-Diet and long-term maintenance, within routine NHS care	2	3	1	2	4	
EMPOWaR	Efficacy of metformin in pregnant obese women: a randomised controlled trial	4	4	5	2	4	
FFIT	A gender-sensitised weight loss and healthy living programme for overweight and obese men delivered by Scottish Premier League football clubs (FFIT): a pragmatic randomised controlled trial	2	3	1	2	3	
GCWMS	Outcomes of a specialist weight management programme in the UK National Health Service: prospective study of 1838 patients	1	4	5	2	2	
Gray et al	Addressing male obesity: an evaluation of a group-based weight management intervention for Scottish men	5	4	1	2	3	
Gryka et al	Alterations in the macronutrient content of the diet and effects on body composition, cardiovascular disease risk and the control of energy metabolism in obese patients with type II diabetes mellitus	2	1	5	2	1	
Healthforce	A feasibility study of a personalised lifestyle programme (Health Force) for individuals who have participated in cardiovascular risk screening	4	1	1	2	3	
Karim et al	Economic evaluation of bariatric surgery to combat morbid obesity: a study from the West of Scotland	2	5	5	2	4	
Keep Well	The impact of Keep Well: An evaluation of the Keep Well programme from 2006 to 2012	5	1	1	1	3	
Lara et al	Weight changes after vertical banded gastroplasty	2	4	5	1	4	
Leslie et al	Changes in body weight and food choice in those attempting smoking cessation: a cluster randomised controlled trial	2	1	1	2	1	
Lighterlife	Randomized clinical trial of standard dietary treatment versus a low-carbohydrate/high-protein diet or the LighterLife Programme in the management of obesity	2	4	1	2	1	

Appendix 2: Intervention Studies

Study ID	Study name	<i>*See Appendix 1 Codebook for coding definitions</i>				
		Methods	Participants	Environment	Scale	Focus
Logue et al	Educational intervention for primary care practitioners regarding how to appropriately discuss weight issues during type 2 diabetes consultations	2	8	5	1	3
Lyndal et al	Metformin and Weight Loss in Obese Women with Polycystic Ovary Syndrome: Comparison of Doses	2	4,5	5	2	4
MACRO	Modifying Alcohol Consumption to Reduce Obesity (MACRO): developing and feasibility testing of a complex community-based intervention for men	4	4	1	2	3
MAGIC	Physical activity to prevent obesity in young children: cluster randomised controlled trial	2	1	1	2	2
MAMMiS	Promoting physical activity among postnatal women: the More Active Mums in Stirling (MAMMiS) study	2	1	1	2	1
Mercer	Living well with multiple morbidity: The development and evaluation of a primary care-based complex intervention to support patients with multiple morbidities	2	1	1	2	3
Nikolaou et al	Preventing Weight Gain with Calorie-Labeling	1	1	1	2	1
optiMum	NHS Tayside's maternal obesity service: optimum	2	5	1	2	3
PODOSA	Effect of a lifestyle intervention on weight change in south Asian individuals in the UK at high risk of type 2 diabetes: a family-cluster randomised controlled trial	2	1	4	2	3
Power et al	Developing recommendations for a workplace-based weight management intervention targeted to registered nurses	4	8	1	2	3
Preiss et al	The effects of 8 months of metformin on circulating GGT and ALT levels in obese women with polycystic ovarian syndrome	2	4	5	2	4
PRO-MAN	The effect of nutrition counselling and self-help resources on body weight and quality of life in overweight men treated for prostate cancer: the PROstate cancer weight MANagement (PRO-MAN) pilot trial	4	3	1	2	1
Rolland et al	Weight loss in obese women with Polycystic Ovary Syndrome (PCOS): a randomised controlled trial	2	4	5	2	1
SCOTS	SurgiCal Obesity Treatment Study: a prospective cohort study	1	4	8	8	8
SCOTT	Randomized, Controlled Trial of a Best-Practice Individualized Behavioral Program for Treatment of Childhood Overweight: Scottish Childhood Overweight Treatment Trial (SCOTT)	2	2	1	2	3
Simpson et al	'HelpMeDot!' a web, app and text based intervention to facilitate social support to achieve and maintain health related change in physical activity and dietary behaviour	2	4	1	2	3
TAKE 5	An open study of the effectiveness of a multi-component weight-loss intervention for adults with intellectual disabilities and obesity	2	4	1	2	1
Telescot	Feasibility study of the use of telehealth as the preferred mode of delivery of a family intervention for childhood obesity	4	4	1	2	3
UPBEAT	A complex intervention to improve pregnancy outcome in obese women; the UPBEAT randomised controlled trial	2	4	1	2	3
WISE OWLS	Ways to Intervene and Support Engagement of Older adults Weight Loss Study (WISE OWLS)	3	4	8	8	8
WELLDO	A single-blind, randomised controlled trial of a weight loss intervention for adults with learning disabilities and obesity: study protocol	4	4	1	2	3
Wright et al	Healthy Weight Communities Programme Evaluation	4	1	1	2	3

Appendix 3: Datasets used for descriptive obesity research in Scotland 2005-2015

- Aberdeen birth cohort
- Aberdeen Maternity and Neonatal databank
- Child Health Surveillance Programme
- Edinburgh Type 2 Diabetes Study
- General Register of Deaths Scotland
- Glasgow and Clyde Weight Management Service
- Glasgow City Council Food Retailers
- Greater Glasgow Health Board Health and Wellbeing Survey
- Growing Up in Scotland Study
- Health Behaviour in School-aged Children Survey
- Healthy Ageing Across the Lifecourse Programme
- ISD Scotland, Child Health Programme
- Lothian Birth Cohort
- Medical Research Council National Survey of Health and Development
- Midspan cohort study
- MONICA survey
- National Food Survey
- NHS Records
- Renfrew and Paisley Study
- Scottish Care Information Diabetes Collaboration
- Scottish Health Survey, National Diet and Nutrition Survey
- Scottish Morbidity Record systems
- Survey of Sugar Intake among Children in Scotland
- The Motherwell Birth Cohort
- West of Scotland 11 to 16 Study
- West of Scotland Coronary Prevention Study
- West of Scotland Twenty 07 Study



ScotPHN r e p o r t

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