The Wells Family Challenge:
A Pharmacist First Approach

Collated and evaluated by 2020health

2020 HEALTH
WELLBEING
RESPONSIBILITY

Sainsbury's Pharmacy

Contents

Foreword by Sainsbury's

At Sainsbury's, as one of the UK's leading food retailers, we take our commitment of being the best for food and health very seriously. We recognise our responsibility to help our customers make healthy choices, via clear nutrition labelling, offering a wide selection of affordable healthier products and extensive promotions on healthier products. Clearly, our food offering is central to this responsibility but our network of 253 in-store pharmacies are also a hugely important part of our vision, through the health services they provide for 22 million customers each week.

Indeed, as the shape of the national healthcare system continues to change, so does the role of the community pharmacist. Exploring the future role of the pharmacist is at the very heart of the Wells Family Challenge.

We know that our customers aspire to live healthier, fuller lives and that many of them struggle to overcome some of the barriers to every day good health. That's why we are the first retailer to undertake a social experiment of the nature of the Wells Family Challenge, working with think tank 2020health to explore the potential impact that regular advice and support from an in-store pharmacist could have on the health and wellbeing of ten families across the UK.

By working with our Wells families, we have learnt that pharmacists can play a central role in improving the health literacy of the nation. The potential benefits of this are far reaching; from encouraging healthier lifestyle choices at an individual level, to alleviating pressure on GPs surgeries, to reducing healthcare expenditure on treating conditions such as cardiovascular disease and obesity through early detection and intervention.

We found that by joining the dots between diet, exercise and illness, our pharmacists empowered these families to better health. The measureable effects of the Wells Family Challenge can be seen in lower cholesterol levels, shrinking waistlines, lower blood pressure and an overall sense of greater wellbeing. And our Challenge gave us further proof that our customers are keen to embrace a lifestyle that allows them to spend quality time with family, engaging in shared activities like outdoor pursuits and cooking together.

But although we have found the results of the Wells Family Challenge to be very positive and to confirm our belief of the huge value of our in-store pharmacies, there are other learnings from the exercise. It suggests potential to increase the number of wellness services available to our customers and highlights the importance of food labelling and helping people to make healthy food choices in-store.

Sainsbury's has long led the way in trying to establish a universal system of nutrition labelling that is easily understood and used by our customers. Division amongst the food industry and between the UK government and the EU means that we are still some way from achieving this goal, although Sainsbury's continues to work with the relevant stakeholders to maintain progression.

Our Wells families also commented on their perceptions of supermarket pricing on healthy and not-so-healthy foods. We know people are watching their household budgets with more care than ever and we are aiming to help them do this while still making healthy choices. Sainsbury's already sells 30% of its fruit and vegetables on promotion and we are committed to ensuring that at least one third of our food and drink promotions are on healthier choices by 2020.

I found it genuinely inspiring to see how the families embraced the food and cooking challenges and this makes me even more keen to continue our work in providing customers with ideas for nutritious, well priced meals. We give away 20 million recipe cards each year and campaigns like Active Kids Get Cooking, Love Your Leftovers, Feed Your Family for a Fiver and Make Your Roast Go Further are all designed to help our customers live well for less, wasting less food in the process.

We'll also continue to promote healthy and active lifestyles by giving our customers access to the trained Healthy Eating Advisors that can be found in all our pharmacies. We will continue to invest and expand our pharmacy offering, making good healthcare accessible and easy to fit into our customers' busy everyday lives.

The Wells Family Challenge has proven to us that pharmacy advice in action can help families across the UK achieve gradual and sustained positive lifestyle changes that can make their health aspirations a reality.

Thank you to our Wells families for inspiring us all to better health.

Sarah Warby

Marketing Director, Chair of Health Steering Group, Sainsbury's

Executive Summary

This report analyses and presents a qualitative evaluation of the benefits of the Wells Family Challenge; an assessment of the impact of in-store pharmacists using practical tools and techniques on the health and lifestyle of families. The assessment was carried out from November 2011 to November 2012, in ten Sainsbury's stores with in-store pharmacies across the UK.

The key output from the Wells Family Challenge was a highly informative picture of health literacy across the families involved and the mentoring role the pharmacist can play in preventing illness and encouraging healthier lifestyle choices. Health literacy refers to the empowerment of individuals and communities to read, understand and use healthcare information to access services and to better manage any illnesses they experience (North West Employers 2011: 2).

The findings from the Wells Family Challenge suggest that many people do not understand the links between the food they are eating, exercise and illness. The pharmacists involved in the challenge imparted educational value and in so doing provided much more than a service treating coughs and colds and alleviating pressure on GPs to treat minor illnesses; they can actually help prevent illness, a function that GP surgeries are not always able to fulfill due to competing demands. The early signs of disease start much younger than many understand and fully appreciate and if they are detected earlier, there is a greater chance to change habits and prevent the serious effects of prolonged poor lifestyle choices, ultimately saving GP time and potentially alleviating pressure on NHS services.

Review of key health measurements and qualitative research from the families collated over the course of the year concluded that:

- 65 percent lost weight during the course of the year. Women lost more off their waist circumference than men. On average, men lost 0.31cm from their waist, while women lost 4.99cm.
- 33 percent had high blood pressure at the start of the Wells Family Challenge; this has decreased to 16 percent at the end. 21 percent of the Wells families had normal blood pressure at the beginning of the Wells Family Challenge; this increased to 42 percent at the end.
- 68 percent had high and unhealthy levels of cholesterol at the start of the Wells Family Challenge. Significantly, of these people, 81 percent were unaware of this. By the end of the Challenge, 68 percent had normal levels.
- An improved understanding about health and diet, as a result of pharmacist advice, was considered to be a beneficial and significant factor in the participants losing weight and having a healthier lifestyle in the long term.
- 50 percent of individuals ate no more than two to three portions of vegetables and fruit a day at the start of the Wells Family Challenge. 55 percent now eat five or more portions of vegetables and fruit a day.
- 50 percent of individuals were physically active for approximately 30 minutes per day at the start; this increased to 70 percent by the end.

Based on the findings of the Wells Family Challenge and in particular family members' accounts of their experiences, the Wells Family Challenge demonstrates practical answers and solutions to the following areas:

a) **Lifestyle.** The pharmacist was found to be an efficient and effective means by which to provide information on making healthy lifestyle choices, basic nutrition counselling and dietary advice.

b) **Services.** There is a case to be made for pharmacies taking on responsibility for providing monitoring services for cholesterol, blood pressure and weight management.

c) **Advice.** Forming a good working relationship with the pharmacist provided the families with a valuable opportunity to talk through information and advice with a healthcare professional.

d) **Medicine usage.** Regular contact with and counselling from the pharmacist has improved understanding of various types of medication.

As a result of the findings of the Wells Family Challenge, 2020health has identified 18 considerations across five key themes. In summary, the two key considerations from each section are listed below:

1. Role of the pharmacist

Considerations	Most relevant to
National public awareness campaign to increase the understanding of the pharmacist's role and the value they bring to preventing ill health and assisting the public in self managed treatments.	Royal Pharmaceutical Society Department for Health Health and Wellbeing Boards
'Pharmacy First' – Active national campaign to encourage the public to visit pharmacists in the first instance for health advice, minor ailments and conditions, building upon existing campaigns.	Public Health England Health and Wellbeing Boards

2. Healthy eating and wellbeing

Considerations	Most relevant to
Develop a clear and universal programme which educates people to understand the impact of diet on health and wellbeing and the nutritional content of food.	Public Health England Supermarket/Food industry
Mandatory for the school curriculum to provide practical education for children in helping to eat and cook well.	Department for Education

3. Health literacy

Considerations	Most relevant to
The importance of health checks emphasised and regular health checks offered to people at 25 years of age and then every five years. This challenges the idea that some signs of poor health do not materialise until you are older and would enable focused education to improve health and decision making.	Public Health England NHS
Mandatory for the school curriculum to include health literacy.	Department for Education

4. Supporting and influencing health choices

Considerations	Most relevant to
Food labelling to be consistent, easy to understand and expressed in terms with which everyone is familiar.	Food Standards Agency Department of Health Department for Food, Environment and Rural Affairs
Supermarkets to carry more promotions on healthier foods to encourage people to eat more healthily.	Supermarkets/Food industry

5. Exercise

Considerations	Most relevant to
Develop locally funded initiatives which focus on activities that people can do together in families and groups.	Public Health England Health and Wellbeing Boards
Awareness campaign to promote the mental health benefits of exercise.	Health and Wellbeing Boards Mental Health services

1. Introduction

This report analyses and presents a qualitative evaluation of the benefits of the Wells Family Challenge. The Challenge assessed the impact that in-store pharmacists could have on the health and lifestyle of a group of families over the course of one year. The assessment ran from November 2011 until November 2012, and the pharmacists involved in the programme were based in ten regional Sainsbury's pharmacies across the UK. The programme and the research were both commissioned by Sainsbury's Pharmacy. 2020health provided a source of health expertise and was engaged as an independent body to monitor and evaluate the social experiment.

It should be noted that because of the small sample size, this study should be considered a reflection of the overall impact of the programme and the potential benefits of a community pharmacy advice programme, rather than proof of principle.

The pharmacy's contribution to healthcare

Research indicates that the majority of adults use pharmacies, with 84 percent of adults visiting a pharmacy at least once a year. For 78 percent, the visit is for health related reasons (National Pharmacy Association 2012). Pharmacies are largely used to collect medication prescribed by a doctor and to purchase supplies of over the counter (OTC) medication, either for regular or one off conditions. Adults in England visit pharmacies on average 14 times per year, and on average 11 visits per year are specifically for health related reasons (National Pharmacy Association 2012).

The most frequent users of pharmacies include females, those aged over 35 and those with a long term health condition (LTHC) or disability. Those working full time visit pharmacies less frequently than other groups. If gender and age are considered together, the highest frequency pharmacy users are females aged 35-74 and males aged over 55. Males aged 16-24 use pharmacies the least (National Pharmacy Association 2012).

The NHS Business Services Authority reports show that there were 11,236 community pharmacies in England at 31 March 2012, compared to 10,951 at 31 March 2011, an increase of 285 (2.6 percent). There has been an increase of 15.3 percent (1,488) since 2002-03 (NHS Information Service 2012a: 4).

In addition to the positive impacts on public health and well-being, community pharmacy programmes can be of benefit to the NHS, both in terms of decreasing workload and in terms of cost-savings. Many visits to NHS services were related to conditions which could have been addressed by pharmacist advice such as coughs, colds, headache, constipation, and hay fever.

Background on public health

England is facing a health crisis. Of particular concern and interest is the issue of obesity. The latest NHS Health Survey for England from 2011 (NHS Information Centre 2012b) reported that 65 percent of men and 58 percent of women were overweight or obese. Older children are more likely than younger children to be obese (24 percent of boys and 17 percent of girls aged 11-15, compared with 10 percent and 12 percent respectively among children aged 2-7). It is well known that being overweight increases the risks of heart and liver disease and type 2 diabetes. The risk of coronary

artery disease increased 3.6 times for each unit increase in BMI, and the risk of developing type 2 diabetes is about 20 times greater for people who are very obese compared to individuals of a healthy weight (Kopelman 2007; Field et al 2001). In addition, many may not be aware that obesity also raises the risk of getting some forms of cancer. In fact, ten percent of all cancer deaths among non-smokers are related to obesity.

Obesity-related illnesses and premature deaths can be prevented. It is estimated that a substantial proportion of cancers and over 30 percent of deaths from circulatory disease could be avoided by making healthier lifestyle choices, including improving diet, exercising, and quitting smoking (Boyle et al 2003; NICE 2010). The population targeted by community pharmacists is likely to differ from that which visits their GP. They are more likely to be aware of their health problem and motivated enough to seek advice. GPs often consider their remit as providing a cure as opposed to prevention, something which pharmacists are well placed to offer and support. In this context, pharmacists can make an important contribution to influencing healthier lifestyles.

Information is at the heart of making healthy lifestyle choices. Despite evidence that the public is eager to access dietary advice from primary care professionals, many doctors are reluctant to provide it, citing a lack of adequate training in the area (Moore et al 2000). Therefore, the question is to what extent can this need be easily filled by accessible local resources such as community pharmacies which are centrally located and frequented on a regular basis? The ability to access quickly and conveniently good nutritional information, advice and support from local community resources could provide individuals with the basic foundations they need to lead a healthier life. It seems logical to propose that individuals and families who possess a good understanding of the impact of diet on their health are more likely to make informed choices about what they eat and drink.

The pharmacy's contribution to the community

Community pharmacies have traditionally played a role in promoting health and well-being in their local communities, as they are usually conveniently located in high traffic shopping areas, easily accessible and thus frequently visited.

For many individuals, the pharmacist is their first point of contact and for some, their only point of contact with a healthcare professional. Often pharmacists are able to develop close working relationships with the customers they see on a regular basis, and develop a unique understanding of the needs of their customers and the needs of the community which they serve. In some parts of the UK, doctor-pharmacy integrated programmes are already active. An example is the Nottingham City 'Pharmacy First' scheme, which provides patients with the choice of receiving treatment for minor ailments in a pharmacy setting. The NHS 'Choosing Well' campaign also encourages patients to seek help and advice from a variety of sources including pharmacies and walk-in centres (NHS Direct 2013).

There may be potential in establishing a more extensive and widely available community pharmacy advice programme, complementing services already provided by the NHS, which would be highly visible and accessible to the average individual. The Wells Family Challenge could help to provide a case for such a programme and will therefore form part of the analysis. For instance, the longer opening hours at many stores may prove more convenient to customers.

Medicine usage

England wastes about £300m a year as a result of poor compliance in taking medication (York Health Economics Consortium 2010). Some of this is unavoidable, as patients no longer need their medication, or a medicine is unsuitable for them due to side effects, but much of it is due to patients either not picking up their medication or stockpiling medication which they never use. In addition to the cost aspect, this presents significant consequences for the health and wellbeing of the patients themselves, who by not taking their medication are therefore not properly managing and/or treating their illnesses, compounded by the fact that their doctors are usually unaware that the prescribed medicinal protocol is not being followed.

Given the fact that pharmacists are the health professionals at the point of contact when the patients pick up their medication, it seems reasonable to question whether or not the role of the pharmacist, in addition to providing guidance on proper medicine usage, could also be a source of counselling to help determine the root cause behind the patient's refusal to take the medication. The information can then be conveyed to the doctor, who can take appropriate action such as switching the patient's medication to one with fewer side effects.

In summary, there are four key questions to which the Wells Family Challenge sought to demonstrate practical answers and solutions to:

a) **Lifestyle.** To what extent could easily accessible local resources such as centrally located and regularly frequented community pharmacies, fill the gap in terms of information on making healthy lifestyle choices, nutrition counselling and dietary advice?

b) **Services.** Is there scope for a broadly integrated community pharmacy advice programme to provide services which shift the workload of minor ailments from primary care and emergency services, and help to reduce the costs of NHS treatments through better prevention and disease management?

c) **Advice.** Could there be potential in establishing a more extensive and widely available community pharmacy advice programme which could complement NHS services, such as nutritional advice, cholesterol and blood pressure checks?

d) **Medicine usage.** In addition to the provision of existing guidance on proper medicine usage, could pharmacists also be a source of counselling to help determine the root cause behind patients refusing to take their medication?

And ultimately, in relation to all of the above, what is the impact on the health and wellbeing of the individual and the public health service?

2. Method

Challenge timeline

Programme outline

A detailed method for the Wells Family Challenge is given in Appendix 1. In summary, the Challenge programme consisted of the following elements:

Selection of the families

Ten families plus one backup family (27 individuals), with the surname Wells, were self-selected and asked to fill in a screening questionnaire which would be completed in a phone interview with a Sainsbury's representative and subsequently scored by 2020health. The families from across England were then paired with a local Sainsbury's pharmacist for the duration of one year. Efforts were also made to achieve diversity amongst the Wells families, so that they might represent different types of people, families, challenges, and regions from all across the country. Nevertheless, due to organisational and logistical restraints for the Challenge, it was acknowledged that the sample size would still be small and would not cover all ethnic groups and social categories.

Health assessment

The aim of the health assessment administered at the start of the programme was to establish the Wells family members' baseline health and wellbeing. The health of the family members would subsequently be monitored throughout the lifetime of the Challenge using nine simple but salient measurements as laid out in Appendix 1.

Family seasonal advice and quarterly challenges

A series of shorter, sharper interventions were developed to benefit the families' overall health and wellbeing (see Appendix 1). The aim of these challenges was to provide motivation for the families to run with the programme for its entire duration throughout the year.

Family quarterly evaluations

The Wells families were also asked to complete questionnaires evaluating their experiences with each of the programme activities and the quarterly challenges. These questionnaires sought to determine how the Wells families felt about the experience and whether it resulted in a positive change in their lifestyle.

Family end of Challenge questionnaire and interviews

An end of Challenge questionnaire was devised to gather a final set of qualitative data from each of the families, gathering the families' perspectives on the Challenge as a whole, as well as revisiting themes from the initial health questionnaire. The responses to the questionnaire formed the basis of a series of short interviews with each family, arranged and conducted by 2020health.

Pharmacist quarterly evaluations & end of Challenge questionnaire

All pharmacists were asked to complete a subjective questionnaire administered at the end of each quarter. An end of Challenge interview for the pharmacists was also scheduled in order to ascertain their final reactions and perspectives on the Challenge. This took the form of a semi-structured short telephone interview, based on key trigger questions.

3. Results

Health measurements

In order to achieve an overview of the physical health of the Wells families, the Wells Family Challenge monitored a range of health measurements including BMI, waist circumference, waist to hip ratio and fat content in order to track the changes which occurred in the life of each individual. Appendix 2 contains a table which compares each family's results at the start, midpoint and end of the Wells Family Challenge.

From reviewing the data over the course of the year, the following overall health improvements were recorded by the Wells families:

- 33 percent had high blood pressure at the start of the Wells Family Challenge; this had decreased to 16 percent at the end of the Challenge. 21 per cent of the Wells families had normal blood pressure at the beginning of the Wells Family Challenge; this increased to 42 percent at the end.
- 68 percent had high and unhealthy levels of cholesterol at the start of the Wells Family Challenge. By the end of the Challenge, 68 percent had healthy levels.
- 65 percent lost weight during the course of the year.
- The average loss in waist circumference amongst women was 5cms while men lost on average 0.31cms.
- 58 percent had their QRISK factor reduced, meaning their risk of a stroke or heart attack has decreased.

Weight loss

- **65 percent of participants lost weight during the course of the Wells Family Challenge**

Overall, the Wells families were fairly healthy before they started the Wells Family Challenge. However, over 50 percent expressed the specific desire to lose some weight alongside improving their health and wellbeing.

At the end of the Wells Family Challenge, 65 percent of participants had lost weight. For those individuals who did lose weight, the average weight loss was 4kg. Of all 27 participants, eight individuals gained weight during the year. The average gain was 2.5kg. The family that lost the most weight lost 16kg and the family that lost the least lost 1.8kg.

One of the aims of the data analysis was to determine whether there is evidence that regular intervention and engagement with a Sainsbury's pharmacist had an effect on weight loss amongst the Wells families.

A paired t-test was conducted on the Wells families' data at the beginning and end of the Wells Family Challenge. The result of the t-test indicates that it would appear likely that the Challenge was effective in producing weight loss amongst the Wells families. See Appendix 3 for full details.

Comparison of cholesterol levels

- **68 percent had unhealthy levels of cholesterol at the start of the Challenge. By the end of the yearlong Challenge, 68 percent had healthy cholesterol levels.**

For the purpose of this analysis, the Department of Health and National Institute for Clinical Excellence (NICE) guidelines on cholesterol levels were used as the benchmark. This policy advice is followed by GPs and states that healthy total cholesterol levels are those less than 5.0 mmol/l.

At the start of the Challenge, 68 percent of family members had high levels of cholesterol. By the end of the Wells Family Challenge, 32 percent had high levels.

In the males, the highest percentage of those with high cholesterol was found to be in the 35-44 age bracket. In the women, high cholesterol was particularly prevalent in age groups 25-34, 35-44. By the end of the Challenge, levels in the women in these two age groups had dropped to healthy levels with no instances of high cholesterol.

Of those 68 percent who were found to have high cholesterol levels at the start of the Wells Family Challenge, 81 percent were not previously aware that they had high levels.

Prevalence of high blood pressure by age and sex

- **High blood pressure levels - reduced from 33 percent at the start to 16 percent of participants at the end of the Wells Family Challenge.**
- **Normal blood pressure levels - 21 percent had normal blood pressure at the start, increased to 42 percent at the end.**

The NHS indicate that a blood pressure reading of under 130/80mmHg is generally considered normal (NHS Choices 2012). An individual would be said to have high blood pressure if it was 140/90mmHg or higher. A recently introduced term ‘pre-high’ or ‘prehypertension’ refers to cases where a person’s blood pressure is elevated above normal but not to the level considered to be high blood pressure (hypertension).

As far as females were concerned, there was generally a greater reduction in blood pressure across the age ranges. At the start of the Wells Family Challenge, the age group 25-34 had the higher proportion of those with normal blood pressure, while high blood pressure was still evident in age groups 35-44 and above. By the end point, no woman in the Wells Family Challenge had high blood pressure; every woman had either normal or pre-high blood pressure. Pre-high levels appeared to be more prevalent in age group 35-44.

A review of the data across the start, midpoint and end of the Challenge, showed a reduction in high blood pressure in participating males.

The 55-64 age group demonstrated a shift from high to pre-high with the 45-54 age group remaining largely unchanged and showing high blood pressure. The 35-44 age group remained predominantly pre-high throughout until the end where a proportion (< ten percent) dropped to normal and another ten percent increase to high.

At a national level, latest data (NHS Information Centre 2012b) shows that the prevalence of high blood pressure (hypertension) was 31 percent of men and 28 percent of women in 2011. At the start, the Wells Family Challenge would mirror a similar distribution. High blood pressure was prevalent in 41.6 percent of men and 23 percent of women. By the end of the Challenge, it was prevalent in 33 percent of men with no women recorded as having high blood pressure.

Of those 33 percent who had high blood pressure at the start of the Wells Family Challenge, 75 percent were not previously aware they had high blood pressure.

Waist circumference

- **Women lost an average 4.99cms off their waistline**
- **Men lost an average of 0.31cms off their waistline**

Overall, women lost more off their waist circumference than men. The average loss in men was 0.31cm while for women it was 4.99cm.

The latest NHS Health Survey for England (NHS Information Service 2012b: 16) indicates that a raised waist circumference is defined as greater than 102cm (40.2 inches) in men, and greater than 88cm (34.6 inches) in women.

The majority of women (81.8 percent) saw their waist circumference decrease by approximately 5.5cm. 9.1 percent saw no change and 9.1 percent saw an increase. At the end of the Challenge, 18.2 percent of women remained above the national guidelines and had an increased waist circumference.

The majority of men were below the raised waist circumference value while three men had waist circumferences either just above or borderline on the national mean. As the Challenge progressed, these measurements reduced to below the 102cm threshold.

Furthermore, 42 percent experienced a reduction in their waist circumference of approximately 4cm, while 42 percent saw it increase by approximately 2.4cm. There was a small percentage (16 percent) whose waist circumference remained the same when comparing start and end point data and which remained beneath healthy levels of 102cm.

A comparison of the mean waist circumference in both Wells men and women and national mean is given in Table 1 below. In both men and women, the Wells families were below the national average at the start and the end of the Wells Family Challenge.

According to national data, a higher proportion of women than men have a larger waist circumference (47 percent and 34 percent respectively) and the Challenge mirrored this. At the start of the Challenge 54.5 percent of women had a larger waist circumference in comparison with 25 percent of men. At the end of the Challenge there were no men with an increased waist circumference, 18.8 percent of women had an increased waist circumference.

A bar graph comparing waist circumference data taken at the start, midpoint and end of the challenge for male and females can be seen in Figure 20 and Figure 21 (Appendix 4) respectively.

The two female participants who became pregnant during the Challenge were removed from this comparison.

Prevalence of healthy, overweight and obese BMI by sex

Much of the research on obesity and weight gain does not recommend taking just one value, such as BMI, in isolation (NHS Information Centre 2012b: 17). Whereas overall weight and BMI can be indicators for risk of obesity-related diseases, they are not always accurate. BMI is a comparison of height to weight and does not indicate where fat is located in the body. The location of fat, particularly if it is around the stomach, is more important than the absolute amount of fat when it comes to measuring certain health risks, especially heart disease (Carroll 2006).

The data collected from the Wells' families would support this claim. While comparing BMI measurements demonstrates some change, it does not indicate the same level of reduction and overall positive change that is indicated through the other metrics such as waist circumference.

Overall no significant changes took place in BMI amongst the men. In the women, by the end of the Wells Family Challenge, there generally appears to be more women with a healthy BMI across the different age ranges.

Table 1 - Comparison of mean waist circumference data

	National mean (cm) #	Mean at Start (cm)	Mean at End (cm)	Change
Men	97.1	86.18	85.87	0.31
Women	88.5	80.41	75.42	4.99

(# = NHS Information Centre 2012b: 16)

QRISK assessment

QRISK is a prediction algorithm for cardiovascular disease (CVD) that uses traditional risk factors (such as height, age, systolic blood pressure, cholesterol and BMI) to calculate the risk of having a heart attack or stroke within the next ten years. Using the data received, a QRISK factor value was calculated at the beginning and at the end of the Wells Family Challenge[1]. From the data table in Appendix 2 it can be seen that:

- 58 percent saw their QRISK factor decreased.
- 21 percent saw their QRISK factor remain the same.
- 21 percent saw their QRISK factor marginally increase on average by 0.4 percent. In these cases, only subtle changes were noticed in the range of measures taken which in turn contributed to a nominal rise in their QRISK value.

QRISK puts a figure of 20 percent and above as an 'at risk' category. Only one individual was found to be in the 'at risk' category and whilst some reductions were seen in their measurements, they remained in the 'at risk' category by the end of the Wells Family Challenge.

Potential impact on the NHS

The QRISK results indicate that there may be a case made for pharmacists taking on and providing interventions and programmes, such as QRISK assessments, thus making an impact on the major economic consequences presented by cardiovascular disease (CVD) and coronary heart disease (CHD) as set out in Table 2.

Table 2 - Summary of economic costs of CVD and CHD

	Cardiovascular Disease (CVD)	Coronary Heart Disease (CHD) & Stroke
Cost to health care system (2009)	£8.6 billion	£1.8 billion
Cost per capita	£141	£29 each for the two conditions
Estimated costs to the UK economy	£19 billion a year	£6.7 billion a year
Direct health care costs	46 percent	27 percent
Loss in productivity	34 percent	47 percent
Informal care of people	20 percent	26 percent

Source: (British Heart Foundation 2012: 204)

1 It should be noted that these QRISK values have been calculated on the data generated from the Wells Family Challenge alone and are offered only as indicators.

NHS Health Check is a vascular risk assessment (VRA) and management programme for people in England aged between 40 and 74. Given the fact that vascular diseases are the biggest cause of death in the UK, it is reported that NHS Health Checks programme could on average prevent 1,600 heart attacks and strokes and save at least 650 lives each year (National Pharmacy Association 2010).

The purpose of the NHS Health Check is to identify an individual's risk of coronary heart disease, stroke, diabetes and kidney disease and to communicate it to the individual in a way which they can understand and to help manage that risk through follow up assistance and support (including reassessment every five years). Both the model adopted for the Wells Family Challenge and the findings from the families' experience mirror the expectation of the NHS Health Check which seeks to provide healthy lifestyle advice, signposting to appropriate services and weight management.

The Health and Social Care Act 2012 significantly extended powers and duties of local authorities, including responsibility for commissioning the NHS Health Check from April 2013. At this crucial time of transition in healthcare commissioning, it is important to highlight the work of the pharmacist and the role they might play in the provision of services. As the findings from the Wells Family Challenge suggest, pharmacists could help meet the needs of individuals, support them in their management of risk and help to shoulder responsibility in terms of providing the vascular check, potentially helping the NHS to save money in the long term by treating CVD and CHD through early intervention.

During the course of the Challenge there were a number of breaks in data due to health related issues. Women who become pregnant during the course of the Challenge were removed from both the t-test, BMI and waist circumference analysis as it was obvious and natural that they would gain weight.

In reviewing and analysing the data, it is important to consider the impact of the Hawthorne effect on the results from the Wells Family Challenge. The Hawthorne Effect is a common term used in social research and refers to "a change in a subject's behaviour caused simply by the awareness of being studied" (Macionis & Plummer 1997: 43). Clearly there have been some significant health improvements experienced by the various families through their participation in the Wells Family Challenge. While conclusions can be made as to the extent to which the various interventions have influenced lifestyle choices, the fact that the families were aware of taking part in a Challenge which studied changes in their behaviour and health is a point that should not be overlooked.

Behavioural change

The initial health questionnaires were reviewed and a list compiled of emerging issues and themes identified which are presented in Table 3 below. These themes were tracked through the end of Challenge questionnaire and interviews in an attempt to tell a story of the Wells families and the extent to which behavioural change took place in their lives over the course of the year.

Reviewing these findings suggests that the Wells families were similar to the rest of the national population before the Wells Family Challenge commenced. Over the course of the year, the Wells Family Challenge contributed to bringing about positive changes in the behaviour of these families, suggesting that their behaviour is now better than the rest of the nation.

Table 3 – Tracking the changes

Wells Families in Dec 2011	National comparison	Wells Families in Dec 2012
Diet		
Eating breakfast Breakfast is not eaten by 40 percent of individuals, with 26 percent saying they "often" miss it.	This finding chimes with research published in 2010 which found that two thirds of Britons do not eat breakfast (The Daily Telegraph 2010a). Some 64 percent of people sacrifice breakfast for extra time in bed or to get to work earlier, while those who still have breakfast eat between 7am – 8am in their living room while watching TV, and take about 20 minutes (The Daily Telegraph 2010a). Whereas many people believe that skipping breakfast will help them lose weight, studies actually indicate that those who eat breakfast are less likely to be overweight or obese (Hunty & Ashwell 2007; Sjoberg et al 2003; Bertrais et al 2000; Slega-Riz et al 1998). Furthermore, research	71 percent of individuals report that they eat breakfast every day.

Wells Families in Dec 2011	National comparison	Wells Families in Dec 2012
	also suggests that people who eat breakfast are less likely to suffer from colds and 'flu and less likely to describe themselves as stressed or depressed (Breakfast Cereal Information Centre 2012).	
Fruit & vegetables 50 percent of individuals eat two to three portions of vegetables and fruit a day.	According to recent data, 25 percent of men and 27 percent of women consume the recommended five or more portions of fruit and vegetables daily (NHS Information Centre 2012c: 7). From the initial assessment it would appear that the Wells families show promising signs towards attaining the recommended number of portions.	Consumption of fruit and vegetables significantly improved. Prior to the Wells Family Challenge no more than two to three portions were consumed, yet by the end 29 percent consume two to three portions, while 55 percent eat five or more portions of vegetables and fruit a day.
Evening meal 70 percent eat late (7-9pm) and have their largest meal at this time.	In terms of weight gain, the time a person eats may be at least as important as what they eat, following research published in 2012 (Cell Press 2012). It would appear the health consequences of a poor diet might result in part from a mismatch between body clocks and eating schedules. Consequently to observe whether changing the times at which the families eat may well have an impact upon their weight.	Evening meal times have become earlier. 43 percent eat their evening meal between 6-7pm, with 29 percent eating between 8-9pm and 29 percent between 5:30-6:30pm.

Wells Families in Dec 2011	National comparison	Wells Families in Dec 2012
Exercise		
General desire to lose weight 50 percent are physically active for approximately 30 minutes per day. 70 percent are neither satisfied nor dissatisfied with their health. Less than 25 percent have used fitness programmes (gym, slimming programme) but overall 75 percent have not discovered a helpful programme which they have been able to continue with on a long term basis.	Research in 2010 indicated that the average person exercises just twice a week for 25 minutes a time, below the Government guideline of 30 minutes on five days of the week (Department of Health 2011). Furthermore, the average Briton spends 14 hours and 39 minutes sitting down every day (The Daily Telegraph 2010b). The Wells families reflect these trends. Most are engaged in sedentary work and find it difficult to remain active on a daily basis. Where individuals do attempt to be active they are trying to meet the guidelines of 30 minutes each day.	70 percent report they are engaged in 30 minutes or more of physical activity on an average day. 76 percent say that that this is more in comparison to prior to the Wells Family Challenge. 90 percent are involved in physical activities such as swimming, cycling, sports, cycling on a regular basis. Ten percent attend the gym or fitness programme. 57 percent would classify their health as “above average” since the Wells Family Challenge with 10 percent classifying it as “much better”.
GP visits		
83 percent report that they would visit the GP two to three times a year, mostly for coughs, colds and other minor ailments.	Recent research from the NHS Information Centre, indicates an average patient has 5.5 consultations each year in 2008/2009 (NHS Information Centre 2009), a rise of 1.6 from 1995/1996. In general the Wells families appear to be below the national average for GP consultations.	60 percent said that they had seen their GP the same number of times during the year, which is not surprising as the majority of participants were below the national average for GP visits prior to the Challenge.

Wells Families in Dec 2011	National comparison	Wells Families in Dec 2012
Health		
67 percent report that on average they would fall ill two to three times a year or less. 80 percent do not have any long term illnesses or conditions. Across the families there is a poor or limited understanding of cholesterol and blood pressure.	These findings appear to reflect the national average. According to the Office for National Statistics (2012), the most common reason given for sickness in 2011 was minor illnesses such as coughs, colds and 'flu. These types of illnesses tend to be of short durations with around 27.4 million days lost to minor illnesses.	38 percent report that they fell ill one to two times during the course of the Challenge. 57 percent said that they had not fallen ill at all. On average 59 percent of family members said that by the end of the Challenge their understanding of health issues, such as blood pressure, cholesterol, BMI, fat content and heart disease was better.
Tiredness and lack of sleep In general while 20 percent reported feeling chronically tired, just under 50 percent responded that they had trouble sleeping or achieving restful sleep.	A survey conducted in 2012 found that British adults sleep more than seven hours a night on average but find it hard to get out of bed in the morning (Radowitz 2012). Moreover, it is recognised that engaging in half an hour's exercise each evening would actually help to wind down and de-stress, which in turn would help to induce a good night's sleep.	71 percent report that they do not have trouble sleeping or achieving restful sleep. 29 percent report occasional difficulties. Over half (57 percent) achieve between seven to nine hours

Quarterly challenge outcomes

Family Seasonal Advice Challenge

- **90 percent of respondents appreciated the chance to discuss issues with a health professional on a regular basis.**
- **50 percent felt that they had received the advice before but appreciated the opportunity to talk it through with a health professional.**

Overall there was a high degree of satisfaction with the advice given to the families by the pharmacists. Good rapport with the pharmacist was a strong element in the feedback from families who appreciated the contact time with the pharmacists and being able to learn from their expertise and knowledge.

90 percent of respondents appreciated the chance to discuss issues with a professional, with 50 percent feeling that they had received the advice before but appreciated the opportunity to talk it through with a professional.

90 percent believed that they had followed the advice to some degree. The most common cause for not following advice was time constraint (40 percent). Most said they would consult the internet first for advice, followed by a visit to the GP. It would only be after consulting a GP that a pharmacist would be consulted. This view changed during the course of the year with most families commenting that they would now not consult their GP as frequently but would approach the pharmacist first.

Key learning points

While the majority (90 percent) felt that they had received the advice before, the clear benefit to them was being able to talk it through with a professional.

An improved health awareness of conditions led to 50 percent feeling they were better equipped and better able to follow advice.

Families are now more likely to consult a pharmacist than their GP about minor ailments, colds and 'flu.

> *I never used the pharmacist before other than for a prescription but this has changed my view. I would think about asking the pharmacist first now.*

Family Cooking Challenge

- **60 percent said that the Challenge had increased their awareness of the nutritional balance of their food and helped them to think more about this side of meal planning.**
- **40 percent said they had previously paid little regard to nutritional content of their food but the cooking challenge had helped to change this.**

The objective of this challenge was for each Wells family to prepare, cook and eat together four healthy evening meals in a week from scratch using fresh ingredients.

Most of the families said what they enjoyed about the challenge was actually thinking about, planning and cooking their own meals. There was a real sense of discovering the joy of cooking from scratch and being creative, with the result they enjoyed eating a fresh and tasty meal which they had prepared themselves. Most difficulty was found in simply being organised and having sufficient time to plan meals and ensure the necessary ingredients were available in the home.

The majority (60 percent) said that they did give some consideration to balance of protein, fats and carbohydrate contents and that the challenge had increased their awareness still further and helped them to think more about this side of meal planning, particularly portion control. 40 percent said they had previously paid little regard to nutritional content of their food but the cooking challenge had helped to change this.

In preparing their meal plans, most families expressed the fact that they considered their fruit and vegetable intake (five a day) along with attention to calorie and fat intake and achieving a balance of both meat and fish (20 percent).

Key learning points

Nutritional information is not understood and little regard is paid to it when shopping and preparing for meals.

Portion control comes with careful planning and an increasing understanding of diet and eating habits.

> *I was surprised at how little [calories] you really need and how few calories you burn when sitting at a desk. The challenge made me think about how to eat healthy while I am at work, instead of just eating.*

Family Activity Challenge

- **60 percent of the families found that the activity challenge had given them impetus and the drive to set goals to go out and do something new.**
- **55 percent of families found that they only had to change part of their lifestyle in order to incorporate the challenge activity.**
- **Over half of the families said that they would change at least something about their lifestyle as a result of completing the Challenge, including adopting a good exercise regime, keeping active and a healthy diet.**

This challenge sought to get the Wells families to think about ways they could increase their physical activity and incorporate it into their daily lives. The challenge was to increase over the course of one week the amount they walked/ran to meet 10,000 steps per day. In addition, at least one member of each family was encouraged to participate in a charity event, but this was not compulsory.

Over 60 percent of the families found that the challenge had given them impetus and the drive to set goals to go out and do something new. Many of the families commented on how it had engendered a sense of friendly rivalry and competition among family members. Some frustration was expressed about the pedometer not measuring swimming, pilates or other physical activity, making the pedometer a limited measure.

22 percent cited that difficulty was found in managing work and personal life responsibilities in order to complete the activity challenge. 55 percent of families found that they only had to change part of their lifestyle in order to incorporate the challenge activity. Changes made by the families included; walking the dog to increase number of steps, choosing to take a bike ride instead of a walk and making the effort to take the stairs and not use the lift.

Looking to the future and beyond, all confirmed that they would change at least something about their lifestyle as a result of the activity challenge. Over half cited this would involve adopting a good exercise regime and keeping active, closely followed by a healthy diet and keeping motivated to be more active.

Key learning points

Once the discipline had been established, many did not find it as difficult as before to incorporate regular exercise into daily routine.

Regular exercise helped to engender a greater sense of wellbeing.

Becoming more active is not just about exercise but includes a number of different factors including a healthy diet.

Open Spaces Challenge

- **60 percent confirmed that the open spaces challenges had given them a greater sense of wellbeing as family.**
- **40 percent agreed and 40 percent strongly agreed that as a family they felt healthier having completed the open spaces challenge.**

The objective of the open spaces challenge was to encourage families to participate in an activity that utilised local amenities (for example the local park, swimming pool, nature trail) thereby spending time together and doing something new to improve their health and wellbeing.

The two key aspects of this challenge the families enjoyed most was the time spent outdoors and the time spent together. Other notable responses included the fact that some families used local facilities which they did not know existed prior to the challenge.

The two most common challenges the families experienced were finding a time to undertake the challenge when everyone was free to do so but also when the weather was good enough to go out! Further, planning what to take in a packed lunch was also cited as a challenge. However, the help and assistance from their pharmacist was cited as useful in overcoming this.

As a result of open spaces challenge, 70 percent of families confirmed that it would cause them to change. 60 percent confirmed that the open spaces challenges had given them a greater sense of wellbeing as family, with 20 percent strongly agreeing with this statement. Responding to the statement "As a family we feel healthier" as a result of completing the open spaces challenge, 40 percent agreed and 40 percent strongly agreed. In terms of how the challenge impacted on how they spent time together as a family, 40 percent agreed that it did whilst 20 percent strongly agreed. The remaining 40 percent disagreed largely because they believed they already spent a good amount of time together before completing the quarterly challenge.

Key learning points

Being active can be fun! Enjoying open spaces and visiting new places can be combined with exercise.

Conscious effort was required to plan the activities but once undertaken, the activities proved rewarding both physically and mentally, leading to good quality family time together.

When planning outdoor activities local facilities are often overlooked and people are often unaware of what is available in their local communities.

Doing things together can be a contributing factor to not only improving physical health but also mental health as well.

The Wells' journey: Developing an understanding of health

Overview

All the families were unanimous in their feedback that they really enjoyed the Wells Family Challenge more than they thought they would. At the start of the Wells Family Challenge, approximately 50 percent of each family/couple expressed some doubt as to the overall success of the Challenge and questioned whether it would have any overall impact. Nevertheless, even the sceptical found they learned an enormous amount and felt that, despite their initial reservations, it was a life changing experience. For most of them the Wells Family Challenge represented a lifestyle change rather than improving their health or reducing their dependence on mainstream health services. 76 percent of individuals thought that compared to the start of the Wells Family Challenge, their health was generally better. 86 percent of individuals said that their lives had changed for the better as a result of taking part in the Wells Family Challenge. They were much more likely to exercise and think about staying healthy as a good lifestyle decision to take rather than a way to prevent illness. Unsurprisingly, other than those who had babies, all said they slept better.

For those who discovered that their BMI, blood pressure or cholesterol was high, it was a surprise, as they generally felt fit. 50 percent of those interviewed commented on not understanding how their bodies worked and how they could be symptom free and yet might still become ill in the future. Of those who were found to have higher cholesterol, none had thought about it before and believed that because of their age (some in their late 30's) it was not yet a problem.

From the completed end of Challenge questionnaires and subsequent telephone interviews seven themes emerged from the responses:

1. Eating habits and diet
2. Health literacy
3. Physical activity
4. The pharmacist as a mentor
5. The future role of pharmacists
6. Supporting and influencing health choices
7. Sustainable approach to change

"Portion size was important. We had too much on the plates, so we got smaller plates."

Eating habits and diet

- **90 percent now think of the consequences of what they eat**
- **81 percent pay more attention to portion control and the size of the meals they consume**
- **48 percent admit they ate too much before the Wells Family Challenge**
- **90 percent changed their snacking behaviour**
- **53 percent drink less alcohol than they did before the Wells Family Challenge**

Food choices

All individuals felt that their attitude to food had really changed during the Wells Family Challenge, after gaining a clearer understanding of what was good and bad to eat. This seems to have been the key area which had the greatest impact on the families.

As a result of working with the pharmacist to improve their understanding of diet and food, the families began to make more informed choices about the food they bought and ate. This led them to think more carefully about their intake of fat and calories in proportion to their need and lifestyle.

In the same way, closer attention was paid to carbohydrates and thinking about when and how to eat them. The difference between good fats and bad fats was also recognised and how it is important to maintain some intake of fat but in proportion. Thinking about the way in which food is prepared has also caused many of the families to switch from frying to grilling and steaming instead.

Portion control

Portion control also became an important issue for many of the families. The majority of families thought they were eating healthily, whereas in fact they were eating too much and in at least 40 percent of cases, they realised that they were not burning the food off. Aside from simply cutting down the amount of food prepared, a simple but effective way of addressing this issue has been for some of the families to buy smaller plates to eat from. One family had never plated their meals, preferring to serve themselves and they changed this habit in order to control their meal portion sizes. 81 percent confirmed that during the course of the last year, they had paid more attention to portion control and the size of the meals they consumed, with 48 percent stating that they thought they ate too much before the Wells Family Challenge.

Meal planning

Meal planning also became more of a regular habit for many of the families. The way many of the families shop changed in light of their thinking more carefully about the meals they plan to prepare and cook in the week. Previously many simply bought food and then tried to decide how to use it afterwards.

The task of increasing their intake of fruit and vegetable also necessitated forward planning and employing different methods to change eating habits. For example, one family commented that they put fruit in more strategic places, such as a fruit bowl near the front door to the house, so that fruit could be picked up “on the run”. In other cases, snacks such as crisps were cut down simply by making the decision not to buy them. Where possible, attempts were made to exchange less healthy foods and ingredients for healthier foods.

The majority of families attested to making significant lifestyle changes as a result of participating in the Wells Family Challenge. Eating out had changed for many particularly by thinking more about what they ate when out; for example, in some cases changing the food they had originally ordered. The number of takeaway meals was reduced and the snacking habits of 90 percent of the families changed. Maintaining more regular meal times and eating sensibly during these times have for many resulted in avoiding snacking on unhealthy foods at other points during the day.

Alcohol

While many commented they already did not drink much before the Challenge began, it was clear that those who did were surprised at the number of calories in alcoholic drinks. Consequently adjustments were made in light of this improved understanding with 53 percent of individuals who drank reporting that on the whole they now drank less than they did prior to the commencement of the Wells Family Challenge.

Connecting health and food

The Wells Family Challenge caused 90 percent of the families to think about the food and drink they were putting into their bodies and how it affected their weight, blood pressure and other health data. For many it was an opportunity to 'join the dots' and see the link between health and food and more importantly preventing illness. Even those who were older were conscious of the need to stay healthy to help ensure their latter years were times in which they could maintain independence and get the most out of life.

Key learning points

The families came to understand how eating habits and diet affected their weight, blood pressure and other health data.

Regular meal times, including regularly eating breakfast, helped to develop improved eating habits for the families.

Portion control played a major factor in improving the families' diet.

Maintaining more regular meal times and eating sensibly during these times improved snacking habits.

> *"We became a lot more aware about what we were eating and what was in food. We had to plan ahead more and started eating more casseroles which we could prepare in advance."*

Health literacy

- **80 percent said pharmacist advice shaped their thinking on food, diet, exercise and health**

Nearly everyone stated that they did not really understand the connection between foods and illness and there was a poor understanding and appreciation of what cholesterol and blood pressure represented. Many of the younger individuals thought this was something that older people should worry about and did not worry that their current lifestyle might cause these problems in later life. The early onset of some issues without symptoms did not occur to them and they were not worrying about the future.

The individuals who were not overweight were burning off calories and therefore believed that they could eat sweets, crisps and chocolate without any detriment to their health. This demonstrated a lack of awareness of the silent damage which they could be inflicting upon their bodies along with the myth that thin people do not experience health issues.

Food labelling

A recurring theme was the lack of understanding of the labelling of food content and its relationship to cholesterol, blood pressure, BMI, body fat and so forth. This highlighted the importance of understanding both what is good to eat and what happens to the body as a result of what a person consumes. This more holistic understanding of health appears to be one of the key themes which revolutionised the families' level of health literacy.

Several families used the analogy of their body being like a car. They saw that if the wrong fuel was put into a car, then the car would not run properly or efficiently and thus realised that using the incorrect balance of fuel (food) could have serious implications for their health.

In the final interviews, around 80 percent of the families commented that the information provided by the pharmacists on food, diet, exercise and health had been really useful and had helped to shape and inform their thinking and decisions over the course of the year. The families were unsure as to where else this type of information and advice could have been readily obtained, had it not been given to them by the pharmacists. This highlights the current lack of any formal method of distribution by public health channels.

Smoking

Of the two smokers who took part in the Challenge, one reported that they had stopped smoking during the course of the Challenge, whilst the other had not but noted they were smoking less than before the Challenge started.

Giving time to consider health related issues and making the necessary adjustments to lifestyle can be difficult and challenging if considered on an individual basis. What emerged from the Wells Family Challenge were the families attesting to how it had been more helpful to address health matters as a family, rather than as individuals, which yielded more positive results and had a greater impact on their lives.

Key learning points

In order to adopt a healthy lifestyle, it is not just a case of understanding what is good to eat but also understanding what happens to the body as a result of what a person eats – cause and effect.

It was more helpful to consider health as a family rather than on an individual basis. A family approach yielded more positive results and had a greater impact on the lives of family members.

> *The biggest difference was understanding food labelling and what it means.*

Physical activity

- **76 percent of Wells families are more physically active as a result of the Wells Family Challenge**
- **81 percent said that they now spend more time on sport and physical activities than before the Wells Family Challenge.**

Highlighting the importance of physical activity helped 76 percent of individuals to engage in more physical activity in an average day than they were last year and to realise that joining a gym was not the only answer. 81 percent said that they now spent more time on sport and physical activities than before the Wells Family Challenge. Most families commented that they did not like the gym or found it too expensive. Finding new activities to do together as a family, which used local facilities and which could be incorporated slightly more easily into daily life, had a positive impact. Adopting that approach caused many to see exercise as something enjoyable, fun and possibly even a hobby as opposed to something they did not like at all.

Most agreed that the exercise made them more energised and for some this had improved sleep patterns. Nevertheless, sleep remains an issue for those with young children and particularly for single working parents.

Key learning points

Increasing physical activity can be achieved through various means and not exclusively through joining a gym.

Pharmacist as a mentor

There was a general feeling in the families that preventative medicine did not have much relevance to daily life. A lot of discussion centred around preventing the spread of colds and 'flu, protection from sunburn and the impact of smoking on cancer. However, preventative medicine was not seen as helpful as an aid to understanding matters like cholesterol levels, blood sugar and blood pressure.

Talking through issues

What has emerged from the Wells Family Challenge is the difference made by talking these kinds of issues through with a pharmacist. 90 percent of the families felt the seasonal advice offered by pharmacists was already well known to them. More than simply acting as a point of contact to talk through issues, the pharmacists became regarded as mentors who provided support and education, which allowed some daily health issues to be addressed and understood more clearly. All families reported a desire to please their pharmacist and were highly motivated by the monthly visits. Trust was highlighted by the families as important in developing a relationship with their pharmacist.

Time to talk

There was a clear distinction between the nature of relationship the families perceived they had with their pharmacist and their relationship they had with their GP. This was not based on their GP's manner or approach, but on the basis that GPs were extremely busy with very demanding workloads. Pharmacists were considered to have the time available to talk through issues with individuals in a less busy environment. The families had no hesitation in asking their pharmacist what they thought might be a trivial question whereas they felt that they would be wasting their GP's time.

Key learning points

More needs to be done in terms of improving public understanding and awareness of cholesterol, blood pressure and blood sugar level readings.

A key benefit of establishing a working relationship with the pharmacist was that it allowed families to talk through health advice already known to them.

> *"We would consult the pharmacist before the doctor now as we have trust in what they can do."*

Future use and role of pharmacists

- **The most common perception of the pharmacist pre-Challenge was as someone who just dispensed prescriptions.**
- **Pharmacy services found to be most helpful were cholesterol monitoring (75 percent), weight monitoring (12.5 percent), blood pressure monitoring (12.5 percent).**
- **The majority of families felt the wellness checks offered by pharmacists were very useful.**

The most common perception of the pharmacist was as someone who just dispensed prescriptions. Most said they were not aware of the depth of knowledge, training and expertise pharmacists possessed. Consequently, all families reported that it had changed the way they would use a pharmacist and meant that the pharmacist would be the first point of call for advice on minor ailments. It was noted that the hours of access were better than for GP surgeries.

Relieving pressure from GPs

The families generally felt their GPs were overworked and that it would be better for pharmacists to carry out routine testing like blood pressure, cholesterol and blood sugar. It was perceived that this would relieve pressure on the GPs and their surgeries. The families felt the pharmacists had more time available to explain what actions to take to improve or reduce levels of cholesterol, blood pressure and so forth. Wellness and wellbeing were seen to be issues with which the pharmacist was better placed to help than their GP. As such the majority of families felt the wellness checks offered by pharmacists were very useful and when questioned confirmed that they would be happy to pay for them as opposed to being offered them for free.

Relationship with the pharmacist

The families rated the relationship they established with their pharmacist as either “good” (24 percent) or “excellent,” (76 percent). The role of the pharmacist was deemed to be “influential” (52 percent), with 33 percent stating it had been “very influential”. The quality of the advice given by the pharmacist was either rated as “good” (55 percent) or “very good” (45 percent).

“I went walking in Derbyshire and was able to do 8 ½ miles. Without the weight loss and getting my blood pressure under control I couldn’t have done that.”

In terms of the information given by pharmacists found to be the most helpful, the following were ranked as the top three:

- Dietary advice.
- How to get more exercise.
- Advice on maintaining an overall sense of wellbeing.

Out of the following three services, the services found to be most helpful were:

- Cholesterol monitoring (75 percent)
- Weight monitoring (12.5 percent)
- Blood pressure monitoring (12.5 percent)

Key learning points

There appears to be a lack of appreciation and understanding of the breadth of knowledge, expertise and services which pharmacists possess and are able to offer.

It is perceived that GPs are overworked and that it would be better for pharmacists to carry out routine testing like blood pressure, cholesterol and blood sugar.

Cholesterol monitoring was found to be the most helpful services offered by the pharmacist.

Supporting and influencing health choices

- **Over 50 percent of families said that clearer food labelling would help them to make better informed choices about the food they buy.**
- **Around 40 percent of the families felt that online shopping had the potential for making nutritional information more easily accessible.**

The families felt that supermarkets are in a prime position to help people make good choices in terms of food selection and should use that power effectively.

Over 50 percent of families said that food labelling ought to be clearer and more explicit about content in order to help people make informed choices. Food retailers and manufacturers needed to take more responsibility and be consistent in making clear the sugar and salt content of food and, where possible, to take steps to reduce sugar and salt content.

Nutritional content of food

As a result of paying more attention to the nutritional content of food, many families reported they were extremely surprised as to the hidden salt and sugar content in food. Their experience was that that food often promoted in 'Buy one get one free' offers and multi-buy offers contains a higher proportion of unhealthy ingredients. This does not necessarily mean eating these types of food is wrong. The families realised, however, that having a more coherent understanding of food, diet and appropriate portion size of these foods, they could still be eaten, though not in the quantity or with the frequency than previously thought.

The point was made by several families of the difficulties which can arise in selecting food for a well managed and balanced diet. For example, foods coded green do not necessarily contain everything that is needed. While red coded foods may contain 30 percent of the Guideline Daily Amount (GDA), a single portion may be the only source of that particular kind of food an individual consumes in a day. For example, consuming a single portion of cheddar cheese which provides a good source of calcium.

Online shopping

The families commented that the advent of online food shopping has not made discovering the nutritional information about food any easier. Many families commented that, in general, it was easier to find the information in-store than online. Around 40 percent of the families felt that far from rejecting online shopping outright, they saw the potential for developing this form of shopping so that information could be made more easily accessible and available and that the same system used in-store could also be used online.

Cost of food

The cost of food is also a key factor in determining whether the correct food for a balanced diet is purchased. The families commented that generally they perceived that cheaper food is often unhealthy while healthier foods are more expensive. There was strong agreement that the food industry should do more to promote good and healthy food at cheaper prices.

Key learning points

The labelling of food should be clearer so that it is easier to understand.

Online food shopping could be used more to disseminate nutritional information about food products.

Sustainable approach to change

All families concluded that the Wells Family Challenge had been effective in driving and sustaining change. Over the year, the interventions helped build steady progress and kept the focus on the long term as opposed to short and quick outcomes. The families felt this played a crucial part in their success over the course of the year.

With growing public awareness of the implications of an ageing society, the majority of families recognised that if you want to live longer then you have to take responsibility and do something about it. The Wells Family Challenge helped them to see how they could prepare for this through small changes which are focused on the long term. What emerged for many was the importance of making changes earlier in life before it became more difficult to make those changes as they aged.

Key learning points

A yearlong supported programme allowed the families to build steadily on progress and kept the focus on the long term as opposed to short and quick outcomes.

Pharmacist assessments

Quarterly evaluations were conducted with the pharmacists over the course of the Wells Family Challenge which helped to track and evaluate their responses to matters such as their relationship with the families and application of knowledge and skills.

Reflections on the Wells Family Challenge

Most family consultations were achieved within 30 to 45 minutes for a family of four. This became quicker as the Wells Family Challenge progressed and familiarity with processes improved. Working families had particular problems fitting consultations in during the working day, so the pharmacists had to make the necessary adjustments to their schedules. At the beginning of the Wells Family Challenge, the pharmacists did find fitting in appointments with the families time consuming and labour intensive. As the Wells Family Challenge progressed, 50 percent of pharmacists found that the process became faster and they became more efficient in their use of time.

Reflection on readiness and competencies

Information and knowledge

Overall the pharmacists felt that they had been trained sufficiently and thus were competent to carry out what was expected of them. The Wells Family Challenge helped to highlight the part of their role that they most enjoyed. Activities such as medicines reviews often gave them the chance to get more involved in the delivery of holistic service to customers, but the approach adopted by the Wells Family Challenge went a stage further and for most this was very satisfying. Many of the pharmacists commented that their contact with the families had given them the opportunity to refresh and read up on certain subjects although they felt they had sufficient knowledge to know where to access relevant information and resources.

Motivational skills

The pharmacists felt they would have benefited from further training in motivational skills in order to keep customers inspired and pursuing goals even when there was little change taking place in real time. The pharmacists recognised the importance of being able to sift information and point people in the right direction to seek additional information and reported enjoying using those skills.

Reflection on the relationship with families

Trust and relationships

All pharmacists reported a very positive relationship with the families. There was a strong emphasis on developing a holistic approach to their relationship in order to yield results. It was not just about weight loss and using weight as the only metric, but also monitoring and tracking body shape changes, reduction in blood pressure and so forth. The importance of trust was found to be significant in making progress and building good relationships with the families. The majority of pharmacists also stressed the important of emphasising a slow pace of change to families as opposed to seeing rapid changes in a short space of time. At times, the pharmacists felt that the families were trying too hard to please them!

Openness in discussion was also stressed as a key factor in establishing a successful relationship with family members. The level of openness that existed assisted in working through issues together as opposed to the individual being instructed by the pharmacist. Of particular significance was the fact that the pharmacists recognised that most people knew what they should be doing but did not always know *how* to do it.

Reflections on what could have been done better or differently

Overall, there was a sense that the families did well and felt better as a result of completing the Wells Family Challenge. Consequently, the positive results meant the pharmacists all felt they would not have done anything differently.

Most felt that the real difference they had made to the families was in encouraging understanding about food and healthy lifestyle. Most pharmacists expressed a desire to have been involved in the original design of the Wells Family Challenge and that this would have encouraged buy in and perhaps assisted with the issue of families' time commitments.

Support staff involvement

The pharmacists felt that other colleagues that worked within the pharmacy could have been more involved in the execution of the Challenge, giving opportunity for mutual knowledge exchange and learning.

Reflections on what was learned

Scope for future projects

Generally, the pharmacists were of the opinion that there was a lot more scope to help other people using a programme similar to the Wells Family Challenge. For instance, a weight loss management clinic could be managed in-store looking at the foods on the shelf and helping people to plan meals. The importance of the wellness checks could be promoted and advertised more.

What emerged from all the interviews was the hope that rather than this being an isolated project, it would become the start of a succession of projects to help people improve aspects of their health. There was a sense of satisfaction that they had identified conditions that the families did not know they had (e.g. high cholesterol). In addition to the holistic approach taken, the importance of learning about how physical health can affect mental health was evidenced by the improvement in the Wells family members' lifestyles and health.

The role of the in-store pharmacy

Most pharmacists felt that the Wells Family Challenge helped to raise the profile of the pharmacy instore. Nevertheless, most felt that pharmacy was not as well understood as it could be and there was still greater scope to develop this further.

The pharmacists were of the opinion that there needed to be more advertising in-store about healthy eating and diet. A store tour with traffic lights and wheel to show people how to shop for a balanced diet was suggested. A strong theme emerging from the interviews and the Wells Family Challenge was the widespread confusion and lack of understanding regarding food labelling and the selection of food to create a balanced diet and initiatives like a series of 'Healthy Eating Days' in-store, aimed at different target groups such as older people or children, were suggested.

Empowerment

The Wells Family Challenge gave pharmacists a sense of empowerment in taking the initiative to introduce promotions, thinking about how they undertook the Medicines Use Review (MUR) and to think about broader health matters other than the MUR. They expressed a real desire to reach more people and make a positive impact on their health. Overall there was a very positive response to the Wells Family Challenge.

Key learning points

Pharmacists enjoyed developing a holistic approach to provide services for their customers.

There is the need to develop motivational skills training for pharmacists so that they can help encourage people to stay focused even when little change is seen.

There needs to be more advertising in-store about healthy eating, diet management and understanding food labelling.

Consideration needs to be given to the best way to generate public awareness about the role of the pharmacist, what they can offer and how they can complement and support other healthcare services.

4. Conclusions & considerations for the future

Conclusions

The key finding of the Wells Family Challenge was a highly informative picture of health literacy and the mentoring role that pharmacists in general can play in preventing illness and encouraging healthier lifestyle choices. Health literacy refers to empowering individuals and communities to read, understand and use healthcare information to access services and to better manage any illnesses they experience (North West Employers 2011: 2).

The findings from the Wells Family Challenge identifies that people do not generally understand the links between the food they are eating, exercise and illness. The pharmacist imparted educational value and in so doing, provided much more than a service treating coughs and colds and alleviating pressure on GPs to treat minor illnesses - they can actually help prevent illness, a function that the GP surgery is currently unable to fulfil due to competing demands. The early signs of disease start much younger than many understand and fully appreciate. If they are caught soon enough there is a greater chance to change habits and prevent the serious effects of prolonged poor lifestyle choices. This will ultimately save GP time, and in the long term, alleviate the pressure on NHS services that results from prolonged poor lifestyle choices.

Review of key measurements and qualitative research from the families collated over the course of the year concluded that all families established positive influential relationships with their pharmacists. The families also saw changes to their health take place, with over half of them experiencing weight loss and reduction in blood pressure and cholesterol levels.

Based on the findings of the Wells Family Challenge and in particular family members' accounts of their experiences, the following are responses to the four key questions to which the Wells Family Challenge sought to demonstrate practical answers and solutions:

i. **Lifestyle.** *To what extent could easily accessible local resources, such as centrally located and regularly frequented community pharmacies, fill the gap in terms of information on making healthy lifestyle choices, nutrition counselling and dietary advice?*

   Easily accessible local resources, such as community pharmacies, do appear to be an efficient and effective means by which to provide information on making healthy lifestyle choices, nutrition counselling and dietary advice. On average, 59 percent of family members said that by the end of the Challenge that their understanding of health issues, such as blood pressure, cholesterol, BMI, fat content and heart disease, was better. Of the information given by the pharmacist, dietary advice was found to be one of the top three rated as most helpful, along with advice on maintaining an overall sense of wellbeing and how to get more exercise.

ii. **Services.** *Is there scope for a broadly integrated community pharmacy advice programme providing services which shift the workload of minor ailments from primary care and emergency services and help to reduce the costs of NHS treatments through better prevention and disease management?*

   There is a case to be made for pharmacies taking on responsibility for provision of services from primary care. In particular, providing monitoring services for cholesterol, blood pressure and weight management, all factors associated with

increasing the risk of cardiovascular disease (CVD) and which were found to be useful to the families. Helping to make these services more easily available, coupled with raising health literacy levels of these issues, indicate the increasing role for pharmacists to help the NHS make savings in terms of the overall cost of treating CVD. Cholesterol testing and other CVD related assessments could be undertaken by pharmacists on a much wider scale, as not all pharmacists currently offer these services.

iii. **Advice.** *Could there be potential in establishing a more extensive and widely available community pharmacy advice programme which could complement NHS services, such as nutritional advice, cholesterol and blood pressure checks?*

The family members' accounts indicated that the pharmacists provided them with a valuable opportunity to talk through this information with a healthcare professional, leading to improved levels of follow through on the advice given. This highlighted the potential of establishing a more extensive and widely available community pharmacy advice programme which could support and complement the work of GPs and their practices and other NHS services.

iv. **Medicine usage.** *In addition to the provision of existing guidance on proper medicine usage, could pharmacists also be a source of counselling to help determine the root cause behind patients' failure to take their medication*?

Over the course of the year, it became apparent that the majority of the participants did not need or were using medicines on a regular, long term basis. Consequently, the original intention of seeking to help explain why patients failed to take their medication cannot be easily answered through the Wells Family Challenge. Nevertheless, regular contact with and counselling from the pharmacist certainly has improved understanding of various types of medication.

In the case of one individual who is asthmatic, having the opportunity to talk through with the pharmacist how to properly use her inhaler significantly improved the management of her asthma. Likewise, those women who either had just given birth or became pregnant during the course of the Challenge benefited from the opportunity to talk through with the pharmacist what medication they could or could not take during and after pregnancy. These examples demonstrate the value of the counselling pharmacists are able to offer with regard to medicine usage.

This small scale study should be considered as a reflection of the overall impact of a community pharmacy advice programme and does not serve as proof of principle. Nevertheless, it is hoped that the Wells Family Challenge will help stimulate further, broader discussion and consideration about the future role of pharmacists and their role in public health.

Considerations for the future

The following series of future considerations, for pharmacy providers, retailers and healthcare providers and stakeholders, are based upon the findings and personal accounts from family members and cover five key themes:

1 - Role of the pharmacist

Most families were surprised to learn of the pharmacists' expertise and knowledge. A more robust strategy needs to be introduced to help raise the profile of pharmacists and the kind of services and expertise they are able to offer. Due to the small sample size for the Wells Family Challenge, it was relatively easy to implement but did present challenges in terms of time management towards the start of the Challenge. Scaling up a similar programme would require that consideration be given to the necessary allocation of time and resources for the programme to succeed.

By forming a good trust-based relationship with the pharmacist, a mentor-type relationship was quickly established with the families, which allowed many of them to gain a holistic understanding and approach to health. This allowed for a greater understanding of how steady changes made over the mid to long term made for a greater impact than changes designed to bring about results. Wellness and wellbeing were seen to be issues with which the pharmacist was better placed to provide help than a GP.

	Considerations	Most relevant to
1	National public awareness campaign to increase the understanding of the pharmacist's role and the value they bring to preventing ill health and assisting the public in self managed treatments.	Royal Pharmaceutical Society Department for Health Health and Wellbeing Boards
2	'Pharmacy First' – Active national campaign to encourage the public to visit pharmacists in the first instance for health advice, minor ailments and conditions, building upon existing campaigns.	Public Health England Health and Wellbeing Boards
3	Training in motivational and coaching skills to be added to the skill set of the pharmacist. This would help to develop their potential to provide mentorship and encouraging self help.	General Pharmaceutical Council NHS Pharmacy Education, Development and Training Royal Pharmaceutical Society
4	Pharmacists to provide a range of test services including NHS Health Check and QRISK assessments, and measuring cholesterol, blood pressure and blood sugar. Local provision of the above to form part of the joint strategic needs assessment and joint health and wellbeing strategy for which local government will be responsible for from April 2013.	General Pharmaceutical Council Department for Health Local government Health & Wellbeing Boards GP surgeries

2 - Healthy eating and wellbeing

The Wells Family Challenge resulted in the families developing a greater understanding of healthy eating. As the families worked with the pharmacists in monitoring their monthly measurements, they began to think more about what they ate, how they prepared it and the content of food. Consequently, individuals and families who possess a good understanding of the impact of diet on their health are more likely to make informed choices about what they eat and drink.

A greater understanding of portion control led to improved diet management and better eating habits, including regular meal times and eating breakfast more often. As the families began to eat more healthily, they also began to feel more healthy. They felt less tired and more positive about life.

	Considerations	Most relevant to
5	Develop a clearer and universal programme which educates people to understand the impact of diet and the nutritional content of food.	Public Health England Supermarket/Food industry
6	Increase efforts to raise the profile and accessibility of resources designed to increase healthy eating and improve diet.	Public Health England Supermarkets
7	Mandatory for the school curriculum to provide practical education for children in helping to eat and cook well.	Department for Education

3 - Health literacy

A basic knowledge and understanding of preventive medicine was prevalent amongst all families at the start of the Wells Family Challenge but the difference was seen in being able to talk about it to a professional in order to gain a greater comprehension of how the body operates. Viewing their personal health holistically empowered the families to manage their health and lifestyle choices proactively.

To date, public health campaigns have focused on raising awareness of the right and wrong foods to eat; the results of the Wells Family Challenge indicated a need to link this with a more nuanced approach to improving an understanding of how the body works and why it is beneficial to eat certain foods. Rather than merely providing a set of lifestyle guidelines, this approach improves literacy and empowers the individual to increase their understanding of their body and to take responsibility for their health.

The Wells Family Challenge demonstrated how some people consider issues such as cholesterol as being age specific. Whilst certain age groups may be more at risk, these are issues which everyone must be aware of and take active responsibility for.

	Considerations	Most relevant to
8	Improve the nation's health literacy. Create an understanding of the impact on the body of poor lifestyle choices.	NHS Public Health England Health and Wellbeing Boards Department for Education
9	The importance of health checks emphasised and regular health checks offered to people at 25 years of age and then every five years. This challenges the idea that some signs of poor health do not materialise until you are older and would enable focused education to improve health and decision making.	Public Health England NHS
10	Mandatory for the school curriculum to include health literacy.	Department of Education

4 - Supporting and influencing health choices

An attendant key problem of health literacy the families encountered was applying this understanding when shopping for food. Trying to understand food labelling and the nutritional information it contained was difficult and many families felt that food retailers could do more to make this easier to understand. A system could be used for online shopping which is also available in-store.

Being able to visit a pharmacist in the local supermarket at the same time as doing the weekly food shop was considered to save time as well as a help to locate products in-store which were recommended by the pharmacist.

	Considerations	Most relevant to
11	Food labelling to be consistent, easier to understand and expressed in terms with which everyone is familiar.	Food Standards Agency Department of Health Department for Food, Environment and Rural Affairs
12	More promotions on healthier foods to encourage people to eat more healthily.	Supermarkets/Food industry
13	Online shopping to contain more detailed information on food contents and the health benefits.	Supermarkets/Food industry Department of Health Department for Food, Environment and Rural Affairs
14	Supermarkets should adopt a clearer strategy which helps to promote and raise the profile of the pharmacy and service pharmacists are able to provide, at times convenient to shoppers.	Supermarkets General Pharmaceutical Council Royal Pharmaceutical Society

5 - Exercise

The majority of families (90 percent) who undertook the Wells Family Challenge were engaged in sedentarywork. During the course of the year, all families took steps to increase their level of physical activity with the majority reporting increased levels of physical activity.

This increase has not come from joining a gym or other fitness programme but rather through taking simple steps to increase levels of activity during the day. Action needs to be taken to make the point more widely known that increasing physical activity does not necessarily mean joining a gym. Whilst it is clear that some may well prefer using a gym, there are other, more affordable and accessible, ways to incorporate exercise into daily life.

	Considerations	Most relevant to
15	Re-introduce fun and affordability into exercise. Increasing physical activity can be achieved through various means and not exclusively through joining a gym. The use of local awareness campaigns should be adopted to help achieve this.	Public Health England Health and Wellbeing Boards Sport England
16	Public health initiatives need to increase awareness of how people can integrate exercise more easily into their daily lives, particularly by using local facilities and amenities.	Public Health England Health and Wellbeing Boards Local government
17	Develop locally funded initiatives which focus on activities that people can do together in families and groups.	Public Health England Health and Wellbeing Boards
18	Awareness campaign to promote the mental health benefits of exercise.	Health and Wellbeing Boards Mental health services

5. Appendices

Appendix 1: Method

Selecting the Wells Families

Efforts were made to ensure that the families involved were broadly representative of the population in terms of age range and family make up. Families with the surname Wells were self-selected and asked to fill in a screening questionnaire which would be completed in a phone interview with a Sainsbury's representative and subsequently scored by 2020health. This involved weighting results according to a number of criteria including the number of children in the family, current health needs such as whether or not the individual was overweight, currently receiving cancer treatment or suffering from mental health issues or indeed any other condition which required significant levels of medical intervention that would be deemed as being beyond the reasonable scope of a pharmacist. The reasoning behind this was to ensure that participation in the Wells Family Challenge did not conflict with medical advice and treatment which the individual may have been currently receiving.

The aim of the questionnaire was to screen the families for potential impediments that would not put them at a high risk if they did not complete the year-long programme, and also would make them less likely to benefit from it. The questionnaire also aimed at selecting families with common ailments e.g. insomnia, asthma and weight issues who would therefore be most likely to benefit from pharmacy counselling on diet, lifestyle, and medicines usage. Efforts were also made to achieve diversity amongst the Wells families, so that they might represent different types of people, families, challenges, and regions from all across the country.

Nevertheless, due to organisational and logistical restraints for the Wells Family Challenge, it was acknowledged that the sample size would still be small and would not cover all ethnic groups and social categories. No one was excluded on the basis of social or age related factors. The aim was to ensure as broad a cross section of people involved as possible. The only criterion for exclusion was made on the basis of health.

Assessing the Health of the Wells Families

At the start of the programme, each Wells' family member completed a detailed health assessment questionnaire, which generated a baseline measurement of their health in five main areas: diet, exercise, habits, health and wellbeing, with additional optional questions on specific topics such as men and women's health, asthma and high cholesterol. This assessment was then utilised to identify key areas for improvement.

The Wells families then discussed their assessments with their pharmacist during individual consultation sessions (one-on-one with the pharmacist) or as a family, depending on the individual family's preference. Family members who could not complete the assessments on their own (e.g. children under the age of thirteen) had their assessment completed for them by a parent/responsible family member.

During the consultation session and from the information gathered in the assessment, the pharmacist then devised a personal development plan for each Wells family member in order to ascertain their health and wellbeing aspirations (e.g. losing weight, smoking cessation), and to help them to achieve them through a series of individually tailored goals and action steps. The personal development plan covered seven key categories for improvement: weight, diet, exercise, unhealthy habits, medical conditions, minor ailments, and wellbeing. It was

accepted that not every Wells family member would necessarily have an aspiration for every category, depending on their individual needs. Once the goals and action steps had been agreed for each aspiration, measurable milestones were then identified to allow the pharmacist and the family member to monitor their progress, provide motivation and a personal sense of accomplishment for the family member. As a result of the close and positive relationship formed between the families and their pharmacist, these milestones did end up fluctuating and changing during the course of the Wells Family Challenge, becoming more informal than formal. The expectation on the part of the pharmacist was to work closely with the family members at every step of the process from creation to implementation of their individual plans and provide ongoing support to ensure that their health and wellbeing aspirations, goals, action steps, and milestones would both be challenging and achievable.

Measuring improvement

The aim of the health assessment administered at the start of the programme was to establish the Wells family members' baseline health and wellbeing. The health of the family members would subsequently be monitored throughout the lifetime of the Wells Family Challenge using nine simple but salient measurements, explained in this section (see Table 4).

Table 4 - Measurements

Considerations	Most relevant to	
Weight/BMI	Digital scales	Monthly
Waist Circumference	Tape measure	Monthly
Waist to Hip Ratio	Tape measure	Monthly
Body Composition	Fat content monitor	Monthly
Blood Pressure	Sphygmomanometer	Quarterly
Physical Activity	Pedometer	Daily (during activity challenge)*
Peak Flow	Peak flow meter	Beginning, Midpoint and End*
Blood Glucose	Blood glucose meter	Beginning, Midpoint and End*
Cholesterol	Cholesterol monitor	Beginning, Midpoint and End*

* May take additional measurements depending on circumstances.

Weight/BMI

Weight and height are used to calculate Body Mass Index (BMI), which gives a measure of weight in relation to height. (Whereas overall weight and BMI can be indicators for risk of obesity-related diseases they are not always accurate).

Waist circumference

Measures weight distribution rather than total weight. Those with high levels of visceral fat have a statistically higher risk of developing heart disease, hypertension, insulin resistance, and type 2 diabetes (Duke Medicine News and Communications 2005).

Waist to hip ratio (WHR)

Also measures weight distribution in the body, but it takes body shape into account, which the waist circumference measurement alone does not (Carroll 2006).

Body composition

This measurement is considered a more accurate indicator for risk of obesity-related diseases than weight or BMI because it determines the percent of the body's mass that is made up of fat, while discounting bones and muscle mass, which differs from individual to individual.

High blood pressure, cholesterol, and blood glucose

These measures are included as they are good indicators for risk in developing cardiovascular disease.

Peak flow

A measure of lung function which can be used to diagnose or monitor lung conditions such as asthma or chronic obstructive pulmonary disorder (COPD), and to measure improvements in lung function following smoking cessation. Peak flow is measured by a peak flow meter, which measures the airflow through the bronchi and thus the degree of obstruction in the airways. The meter reading is then compared with a value chart (determined on the basis of age and height). In general, peak flow readings are high when patients are well, and lower when the airways are constricted.

Physical activity

The pedometer measures the number of steps taken over a given time period. Studies show that walking 30 minutes five days a week can prevent visceral fat build-up and pedometers have been shown to be not only a good measure of overall activity, but a successful motivational tool as well (Bravata et al 2007).

The expectation was that each test be administered at the start and end of the Wells Family Challenge in order to establish both a baseline measurement and a final endpoint. For the duration of the Wells Family Challenge, measurements were be taken by the pharmacist during the Wells families' monthly visit. The pharmacist was required to monitor each family member's progress at the monthly reviews and at each milestone. The pharmacist would provide ongoing support to the family members to ensure that progress was made with their plans, and that their goals, steps, and milestones remained appropriate and attainable. Equipment varied between individual families, but the expectation was that the results for each family would be consistently measured and recorded using the same equipment throughout the year.

QRISK Assessment

Data collected during the Wells Family Challenge also allowed for a QRISK factor value to be calculated. QRISK is a prediction algorithm for cardiovascular disease (CVD) that uses traditional risk factors (such as height, age, systolic blood pressure, cholesterol and BMI) to calculate the risk of having a heart attack or stroke within the next ten years. It was developed by doctors and academics working in the UK National Health Service and is based on routinely collected data from many thousands of GPs across England and Wales who freely contributed data for medical research. It has been validated in a UK population by Collins and Altman (2009). Currently the assessment can be carried out only on those over the age of 30 years. Thus nineteen of the Wells family members could have QRISK factor values calculated and compared.

Quarterly Challenges

In addition to the personal development plan, a series of shorter, sharper interventions were developed to benefit the families' overall health and wellbeing. This was a complementary scheme that consisted of a series of quarterly family challenges running concurrently with a more broad-based health advice programme focusing on seasonal issues. The specific challenges are detailed in Table 5 below.

The aim of these challenges was to provide motivation for the families to run with the programme for its entire duration throughout the year, as it afforded them a series of fairly easy, short term challenges that they could attempt as a family to provide them with a sense of accomplishment. This was especially important during periods when they were not achieving significant results in their personal health plans – such as the post-holiday period in January.

Table 5 - Seasonal advice and Quarterly Challenges

Quarter	Seasonal advice given to families	Challenge undertaken by families
November 2011 to Mid-December 2011	Colds, coughs, vitamins, the norovirus, eating well, indigestion and maintaining a healthy diet during the Christmas period, preventing asthma attacks, keeping warm (diabetics), seasonal affective disorder and arthritis. The families were offered free 'flu vaccines.	Family Seasonal Advice Challenge Each family was asked to make a start on their individual health plan, which included advice on diet, exercise and how to combat common winter ailments.
Mid-December 2011 to February 2012	How to eat healthily in the New Year, the importance of cholesterol testing and the support and quit kits available to help people to stop smoking.	Family Cooking Challenge Each family was challenged, to prepare, cook and eat four healthy evening meals in a week, as a family, from scratch, using fresh ingredients. The aim was to encourage the families to think about their dietary habits and attitudes towards cooking and healthy eating.
March 2012 To May 2012	Healthy eating advice and seasonal foods, preparing for hay fever, bites and stings.	Family Activity Challenge Each family was challenged to increase over the course of one week, the amount they walked/ran to meet 10,000 steps per day. In addition, at least one member of each family was encouraged to participate in a charity event, e.g. fun run, bike ride, etc. The aim was to encourage the families to incorporate physical activity into their daily routine so that it became a part of their life.
June 2012 to August 2012	Holiday preparations, dehydration, sunburn, jabs, travel sickness, melanoma checks, more advice on seasonal foods and exercise in hot weather.	Family Open Spaces Challenge Each family was challenged to participate in an activity that utilised local amenities (e.g. park, swimming pool). The aim was to encourage the families to spend time together doing something healthy and to show how simple changes could improve their health and wellbeing.

* May take additional measurements depending on circumstances.

Evaluating the Wells

Monthly evaluation questionnaires

In addition to the monthly measurements taken by the pharmacists to help the Wells families measure their progress in their health improvement plans, the families were asked to fill out a monthly review questionnaire based on the SF-8 Health Survey (QualityMetric Incorporated 2012). The SF-8 was chosen because it is a validated questionnaire that allows for the direct linking of the norms from large population surveys with the results from more focused outcomes research studies, and has been translated and linguistically validated for use in more than 30 countries and languages using IQOLA Project methods (QualityMetric Incorporated 2012).

The Wells families were also asked to complete questionnaires evaluating their experiences with each of the programme activities, the quarterly challenges and the alcohol brief intervention (if one was deemed appropriate by the pharmacist). These questionnaires sought to determine how the Wells families felt about the experience and whether it resulted in a positive change in their lifestyle.

End of Challenge questionnaire

On completion of the Wells Family Challenge, it was imperative to undertake a final evaluation from the perspective of the Wells families to ascertain how effective the 12-month period of pharmacist interventions had been in terms of improving the families' health and wellbeing.

An End of Challenge questionnaire was devised to gather a final set of qualitative data from each of the families. The questionnaire garnered the families' perspectives on the Wells Family Challenge as a whole and revisited themes from the initial health questionnaire that each family member completed at the start of the Wells Family Challenge.

This provided the opportunity to compare and contrast responses on matters such as diet, exercise and managing current health conditions as well as assessing episodes of ill health and sickness, visits to see their GP and how much their health literacy had improved over the course of the Wells Family Challenge. Finally, the questionnaire also looked to the future and questioned the families as to how they saw the choices and decisions which they made regarding their health and lifestyle continuing once the Wells Family Challenge came to an end.

The families were given the questionnaires by their Sainsbury's pharmacist during their final appointment and asked to complete and return them by a set deadline.

Questionnaire design

While questionnaire design is critical to any survey, given the time restraints of the Wells Family Challenge as the 12-months came to an end there was a need to follow a simple yet systematic format which made preliminary analysis and statistical analysis easy. Closed format questions (i.e. multiple choice) were therefore be used alongside important questions as well as Likert questions which helped to ascertain how strongly the families agreed or disagreed with a particular statement.

Interviews

The responses to the questionnaire formed the basis of a series of short interviews with each family, arranged and conducted by 2020health. The interviews were framed by supplementary questions specific to each of the families arising from both the responses gathered through the final questionnaire and the emerging themes and analysis conducted by 2020health over the course of the 12 months.

In order to ensure impartiality, 2020health, who had not interacted with the families, undertook the interviews. The responses to the specific interview questions were recorded by the interviewer as hard copy to form the final set of responses. The responses helped to complete the narrative of the experiences and development of each family over the course of the year.

Evaluating the Pharmacists

A report jointly published by the Pharmaceutical Services Negotiating Committee, National Pharmaceutical Association, Royal Pharmaceutical Society of Great Britain and Pharmacy Health Link concluded that public health practice is about collaborative, organised effort (2004: 30). This is especially so in programmes such as this, which rely on the pharmacist's willingness and ability, in terms of time and expertise to provide ongoing public health counselling and advice to customers. Therefore pharmacists themselves would be the key determinants of the success or failure of any community pharmacy initiative. As part of the Wells Family Challenge outcomes analysis, the pharmacists were assessed by completing subjective questionnaires administered before the start of the programme as a baseline, at the end of each quarter and on completion of the Wells Family Challenge. The questionnaires were confidential and assessed motivation, confidence, training, and time given to the Challenge.

The motivation assessment was designed with the intention of assessing the pharmacists' motivations for patient counselling, and willingness to step into these roles (if they were not already doing so) as well as assessing the impact on their current workload, in order to understand any future implications should these roles be integrated into the work of the pharmacist in the long term.

To achieve a wider implementation of the programme, it is vital that pharmacists are comfortable with fulfilling these roles and also actually have the desire to do so. The confidence and training questions assessed the amount of training and preparation the pharmacists received before the start of the Wells Family Challenge, and whether or not they ultimately felt that it was adequate to prepare them for the challenge. The time spent in training the Wells Family Challenge pharmacists was also assessed in order to ascertain whether or not this could feasibly be replicated on a larger scale. Finally, the time questions aimed to assess how much time the pharmacists spent on patient interactions prior to, throughout and after the Wells Family Challenge. Perhaps the most important key to the success of wider integration was whether an increased level of patient interaction could feasibly be integrated into the pharmacists' daily schedules.

To that end, the pharmacists' time spent on the Wells Family Challenge was evaluated using a consultation recording sheet which kept track of the number of visits that the Wells families made to the pharmacy, how long each visit lasted, and the number of family members seen during the visit.

An End of Challenge interview for the pharmacists was also scheduled in order to ascertain their final reactions and perspectives on the Wells Family Challenge as it came to an end. This took the form of a semi-structured short telephone interview, which contained key trigger questions designed to address the following broad themes:

- Reflections on the Wells Family Challenge
- Reflections on readiness and competencies
- Reflections on the relationship with families
- Reflections on what could have been done better or differently
- Reflections on what you have learned

The emphasis was on allowing the pharmacists to respond as freely and fully as possible, allowing them to space to offer their own thoughts and perspectives.

The key themes under consideration were sent to the pharmacists in advance of the interview. In particular, the interviews aimed to gauge the pharmacists' feedback on how they would consider integrating their responsibilities during the project into the role of the pharmacist in the long term.

Data Collection and Recording

Each set of measurements was recorded at the start and end of the Wells Family Challenge in order to establish a baseline measurement and a final endpoint. For the duration of the Wells Family Challenge, pharmacists were required to take additional measurements based on goals or health indicators.

After each monthly consultation session, the pharmacists were asked to record the Wells' measurements on an electronic spreadsheet. Each Pharmacy Manager assigned each family member an ID code which remained the same throughout the challenge. The record of each patient's code was kept in the patient's secure folder (together with any other information about them) and was stored securely in the pharmacy, in accordance with standard protocols to protect confidentiality.

The monthly measurements and visit (frequency and length) sets of data for each family member were sent by email in accordance with Sainsbury's governance arrangements on security and patient confidentiality, to pharmacy category support staff based at Sainsbury's head offices. Pharmacy category staff then collated the data onto a spreadsheet. The families were assigned a unique identification code and any references to geographical location removed. The newly created data summary was then sent to 2020Health to complete their analysis.

When *ad hoc* visits to the pharmacy occurred, pharmacists recorded the contact time and advice given. On occasions when the Wells pharmacist was unavailable for consultation during an ad hoc visit, the pharmacist on duty recorded the contact time and advice given to the Wells family member.

2020health Steering Group

From the commencement of the Wells Family Challenge, 2020health convened and hosted an external steering group of unpaid health experts. 2020health discussed the process and the findings from the Wells Family Challenge with the experts in a series of meetings. The group's role was not to influence or direct the Wells Family Challenge in a particular way but rather to act as a sounding board for 2020health in its analysis and writing of the report and to provide impartial academic and professional support and advice to the Challenge. Group members included representatives from Heart Research UK, Allergy UK and Asthma UK.

Appendix 2: Individual comparison data table

		START												
Family	OL Code	Weight (Kg)	BMI	Waist Circf (cm)	Waist to Hip ration (WHR)	Blood Pressure (mm Hg)	Body Composit. (%)	Blood Glucose (mg/dL)	Cholest. (mmol/l2)	QRISK Factor (%)	Weight (Kg)	BMI	Waist Circf (cm)
1	1	78.3	31	86	0.77	103/73	40	7.5	3.82	2.8	76.5	30.3	81
	2	88	29	103.5	0.96	130/97	33	5.2	5.08	2.7	85.5	28.6	97.5
2	4	62	21.5	82.5	1.14	125/73	16.4	5.3	5.95	0.7	64	22.1	80
	5	65	21	90	1.09	131/89	25	5.2	5.16	0.6	66	21.3	95
3	6	63.8	24.3	31	0.78	137/80	35	4.2	5.11	8	57.4	21.9	29
	7	85.4	26.8	31	0.78	137/80	35	6.3	5.35	15.1	84.9	27.7	37.5
4	8	55	24.4	77.5	0.81	113/83	35.9	4.4	4.34	3.8	56.3	22.2	77.5
	9	83.6	28.9	93.6	0.86	157/93	30.4	5	5.23	16.3	85	28.7	94.8
5	10	92.2	28.85	98	0.93	113/80	28.1	6.5	5.6	0.9	94	29	102
	11	60.9	24.7	79.2	0.83	87/62	30.4	4.6	6.15	< 30yrs	63	25.6	94
6	12	85	25.7	95	0.93	94/62	21.6	4.3	3.43	23.7	85	25.7	92
	13	64	23.5	89.5	0.93	125/85	30.7	4.1	5.31	18.2	66	24.2	78
7	14	79.05	29	89	0.79	123/82	47.5	4.3	5.18	< 30yrs	74.05	27.2	86
	15	94	28	103	0.94	121/81	32.6	4.9	5.22	0.8	93.8	28	100
8	16	89.8	28.8	104.14	1	156/108	25.5	4.9	5.29	8.4	88.6	28.4	101.6
	17	91.1	35.8	93.98	0.76	137/97	48.6	4.8	5.47	5.7	90.3	35.5	96.52
	18	75.6	28.1	80.01	0.81	114/81	Child	Child	Child	< 30yrs	73.2	26.7	76.2
	19	47.6	21.2	69.85	0.8	Child	Child	Child	Child	< 30yrs	50.9	21.2	71.12
9	20	86	30.1	88	0.78	122/75	42.7	4.9	2.91	0.2	87	30.5	86
	21	22.2	Child	Child	Child	Child	Child	Child	Child	Child	Child	Child	Child
10	22	70.2	24.6	89.5	0.9	115/75	36.5	4.2	5.51	3.2	68.86	24	87.5
	23	93.4	28	96.2	0.9	135/83	25.7	4.6	5.95	6	93.2	28	97.7
	24	56.8	18.3	66.2	0.72	109/64	24.3	4.1	3.44	< 30yrs	62	19.9	70
	25	65.1	20.3	70	0.75	117/67	12.2	7.3	3.27	< 30yrs	55.8	17.8	64.5
11	26	81.4	26.9	91.2	0.88	127/88	22.5	4.4	4.33	1.3	79.6	26.3	92
	27	58.1	22	73	0.74	103/72	36.5	4.1	5.55	0.2	60.1	22.6	88

MID POINT					END							
Waist to Hip ration (WHR)	Blood Pressure (mm Hg)	Body Composit. (%)	Blood Glucose (mg/dL)	Cholest. (mmol/l2)	Weight (Kg)	BMI	Waist Circf (cm)	Waist to Hip ration (WHR)	Blood Pressure (mm Hg)	Body Composit. (%)	Blood Glucose (mg/dL)	Cholest. (mmol/l2)	QRisk Factor %
0.75	101/67	40.7	5.1	3.26	76.9	30.4	80	0.73	117/65	39.9	6.4	3.43	3.1
0.93	111/84	32.7	4.5	5.86	86.7	29	98	0.93	146/97	32	6.3	5.7	3.3
1.18	117/79	16.6	4.4	4.8	64	22.1	80	0.87	121/79	17.8	5.3	5.52	0.7
1.41	110/71	25	5.1	3.92	67	21.6	91	0.92	108/79	26.7	5.5	4.26	0.4
0.78	123/80	28.5	4.4	5.09	54.7	20.4	27.5	0.76	127/73	28.7	3.7	5.62	7.8
0.9	103/91	28.5	7	4.86	78.5	24.2	35	0.89	122/64	22.1	4.8	5.08	13.4
0.88	107/79	29.3	5.3	4.66	56	22.4	74	0.82	96/72	28.9	4.9	4.49	3.4
0.91	121/83	26.5	5	4.45	84.4	28.5	94	0.89	132/91	27.9	5	4.78	13.8
0.88	114/79	30	4.1	5.71	90.17	27.7	100	0.93	100/73	28.5	4.3	5.1	0.7
0.86	93/65	31	4.7	4.26	63.12	26.5	87	0.82	104/78	29.6	4.1	4.41	< 30yrs
0.88	110/71	24.9	4.5	3.77	83	25.1	96	0.91	105/77	23.6	5.3	3.27	23.8
0.8	106/72	32	2.4	4.66	66	24.1	80	0.81	97/62	31.3	5.7	5.53	16.9
0.78	106/74	43.7	4.4	3.75	67.6	24	80	0.78	113/73	42	4	3.52	< 30yrs
0.85	113/69	30.2	4.9	4.58	90	26	97	0.9	114/67	30	5.3	4.52	0.7
0.98	No data	26.7	No data	No data	88.8	28	99.06	0.96	151/101	23	4.6	4.65	7.4
0.8	106/82	48.1	4	4.35	89.8	35.1	93.98	0.79	110/86	47.3	6	4.29	3.6
0.8	118/79	Child	Child	Child	73.4	26.6	72.39	0.76	106/71	Child	Child	Child	< 30yrs
0.81	112/68	Child	Child	Child	53	21.5	74.93	0.83	118/66	Child	Child	Child	< 30yrs
0.76	100/74	43.2	4.4	3.56	84.2	29	85	0.75	98/69	42	4	3.72	0.2
Child	Child	Child	Child	Child	Child	Child	Child	Child	Child	Child	Child	Child	Child
0.89	119/77	35.7	4.5	4.41	64.6	22.8	80.8	0.84	113/69	32.8	4.5	3.94	1.3
0.96	141/77	24.7	4.6	5.05	91.7	27.8	94.5	0.9	151/97	26.8	4.7	5.96	6.7
0.75	115/57	10.8	5.7	2.59	62.2	20	70.5	0.77	116/56	12.7	4.6	2.87	< 30yrs
0.7	95/96	27.4	4.5	3.71	55.8	17.8	65	0.75	101/58	24.5	4.6	3.76	< 30yrs
0.9	125/78	22.4	No data	No data	83.2	27.5	91.5	0.88	123/81	24.9	4.2	4.6	1.3
0.88	107/68	44.4	No data	No data	72	26.5	106.6	1	95/80	42.6	Pregnant	Pregnant	0.2

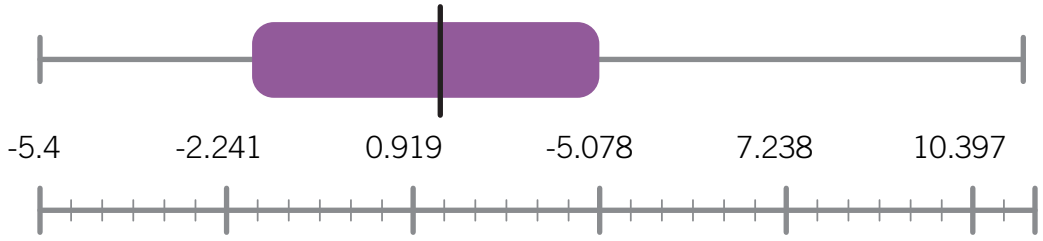
Appendix 3: Paired t-test

A paired t-test was undertaken to establish if the Wells families had lost weight as a result of taking part in the Wells Family Challenge. The difference in weight was compared using the baseline weight for each individual (W1) and subtracting it from the weight measurement at the end of the Wells Family Challenge. The calculation is outlined below.

Considering that from the start of the t-test, the primary intention was to determine weight loss, this can be considered as a one-sided hypothesis test. Thus, for a one-sided hypothesis test the mean weight loss ($M = 1.77$, $SD = 4.39$, $N = 23$) was greater than zero, $t(22) = 1.93$, one tailed $p = 0.033$, providing evidence that the Wells Family Challenge was effective in producing weight loss.

Whilst the t-test gives a positive result it must be considered in light of the fact that there was no control group to compare results against. Also, due to the small sample size potential outliers have not been excluded. It cannot therefore be said for certain that the Wells Family Challenge was the prime causal factor in the family members experiencing their weight loss. At best the t-test results indicates a possibility that there is a trend as well as giving support to the findings from the qualitative data collected through the evaluations, questionnaires and interviews conducted with the families.

Figure 1 – Boxplot showing the distribution of differences in weight loss



	OL Subject code	Before (Kgs)	After (Kgs)	Difference	Deviation	Sq Deviation	
1	F1	78.3	76.9	1.4	-0.368695652	0.135936484	11.45
2	M2	88	86.7	1.3	-0.468695652	0.219675614	9.3
3	M4	62	64	-2	-3.768695652	14.20306692	9.1
4	F5	65	67	-2	-3.768695652	14.20306692	6.9
5	F6	63.8	54.7	9.1	7.331304348	53.74802344	5.6
6	M7	85.4	78.5	6.9	5.131304348	26.33028431	4
7	F8	55	56	-1	-2.768695652	7.665675614	2.03
8	M9	83.6	84.4	-0.8	-2.568695652	6.598197353	2
9	M10	92.2	90.17	2.03	0.261304348	0.068279962	2.2
10	M12	85	83	2	0.231304348	0.053501701	1.8
11	F13	64	66	-2	-3.768695652	14.20306692	1.7
12	F14	79.05	67.6	11.45	9.681304348	93.72765388	1.4
13	M15	94	90	4	2.231304348	4.978719093	1.3
14	M16	89.8	88.8	1	-0.768695652	0.590893006	1.3
15	F17	91.1	89.8	1.3	-0.468695652	0.219675614	1
16	F18	75.6	73.4	2.2	0.431304348	0.18602344	-0.8
17	M19	47.6	53	-5.4	-7.168695652	51.39019735	-1
18	F20	86	84.2	1.8	0.031304348	0.000979962	-1.8
19	F22	70.2	64.6	5.6	3.831304348	14.67889301	-2
20	M23	93.4	91.7	1.7	-0.068695652	0.004719093	-2
21	M24	56.8	62.2	-5.4	-7.168695652	51.39019735	-2
22	F25	65.1	55.8	9.3	7.531304348	56.72054518	-5.4
23	M26	81.4	83.2	-1.8	-3.568695652	12.73558866	-5.4
			Total D	**40.68**			
			Total Sq D			**424.0528609**	

Mean (x)	Sum of Sqs	Std. Dev	Lower Q	Upper Q	df	t	Sig (1 tailed)
1.768695652	19.27513004	4.39	-1.8	4	22	1.93	0.033

Workings for t						
	19.27513004	4.39	-1.8	4	22	
Total Sq D =	424.05286					
	N (23) x 424.05286			=	9753.21578	
Total D =	40.68					
	Sq R 40.68			=	6.378	
	9753.2158 - 6.378			=	9746.8378	
	9746.8378/ (23-1)			=	443.038	
	Sq R 443.038			=	21.048	
	40.68/21.048			=	1.93	
				t =	1.93	

Appendix 4 - Graphs

Figure 2

Comparison of cholesterol levels in males - start point

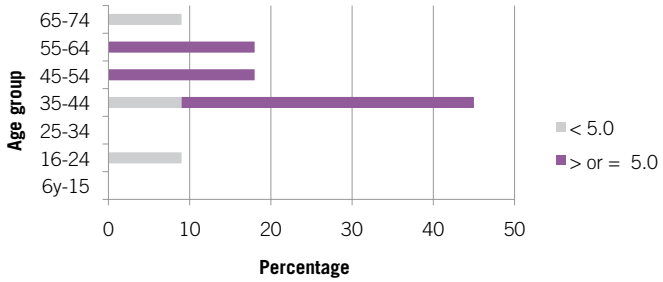


Figure 3

Comparison of cholesterol levels in males - mid point

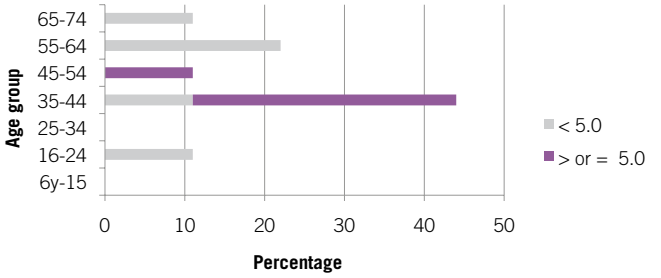


Figure 4

Comparison of cholesterol levels in males - end point

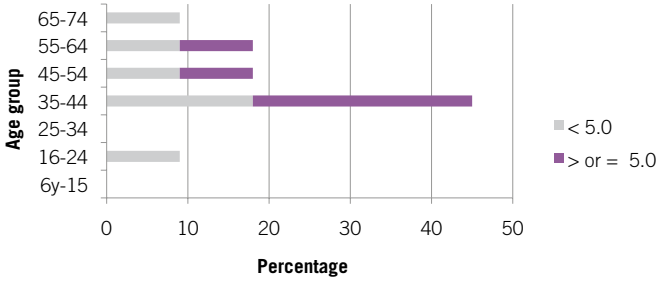


Figure 5

Comparison of cholesterol levels in females - start point

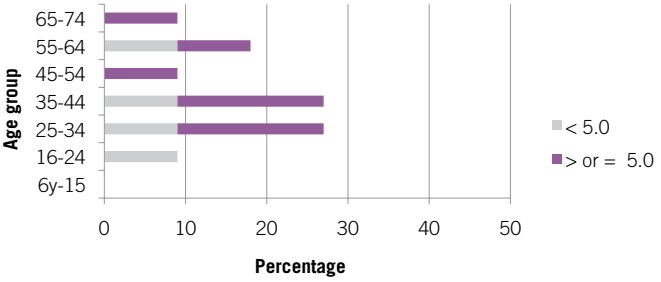


Figure 6

Comparison of cholesterol levels in females - mid point

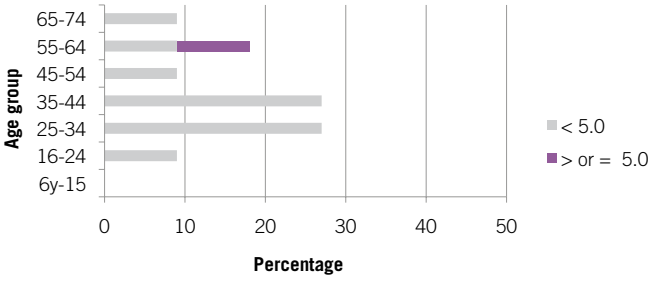


Figure 7

Comparison of cholesterol levels in females - end point

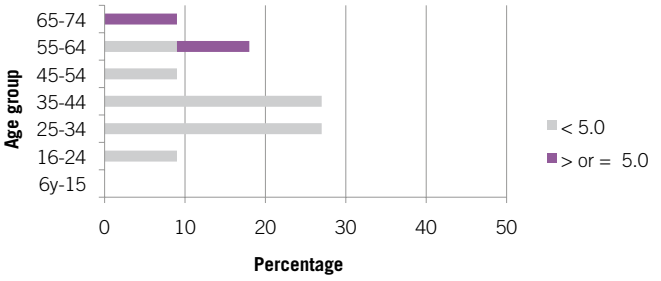


Figure 8

Comparison of blood pressure in males - start point

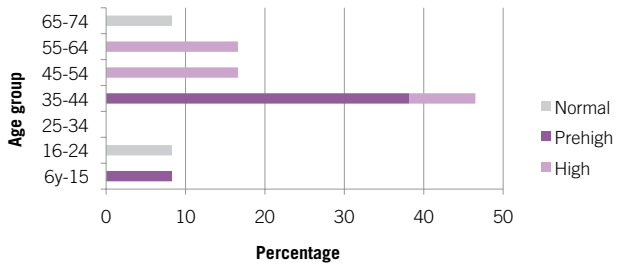


Figure 9

Comparison of blood pressure in males - mid point

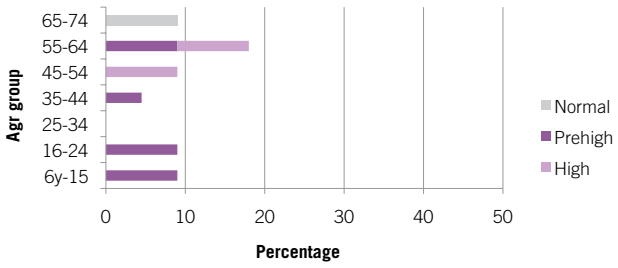


Figure 10

Comparison of blood pressure in males - end point

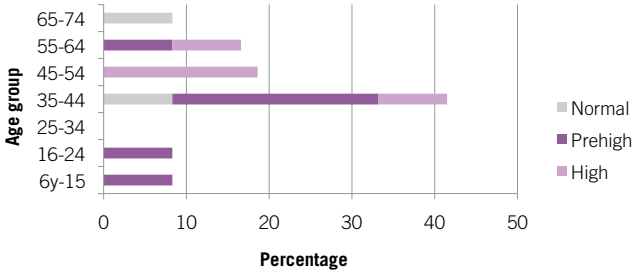


Figure 11

Comparison of blood pressure in females - start point

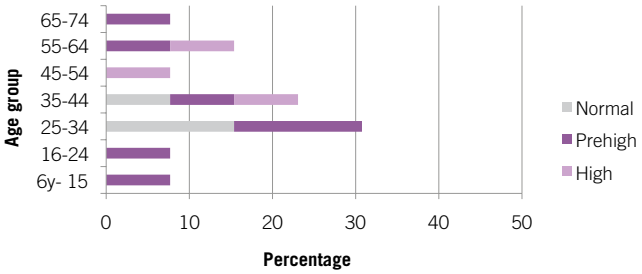


Figure 12

Comparison of blood pressure in females - mid point

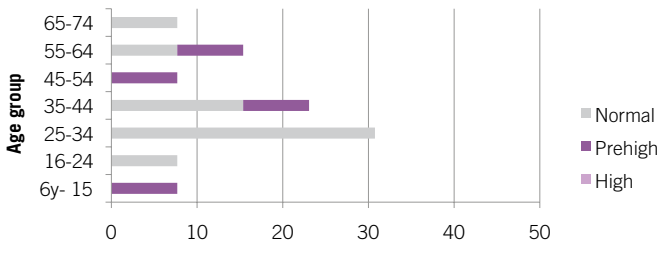


Figure 13

Comparison of blood pressure in females - end point

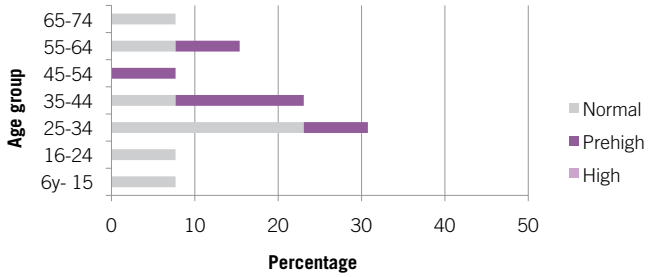


Figure 14

Comparison of BMI in males - start point

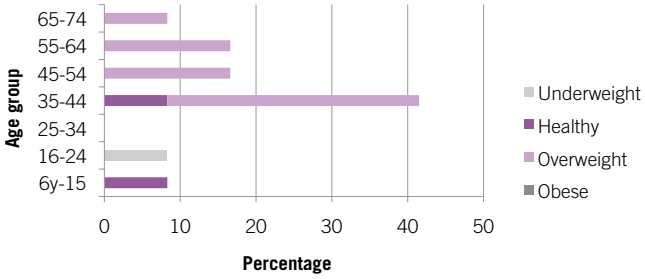


Figure 15

Comparison of BMI in males - mid point

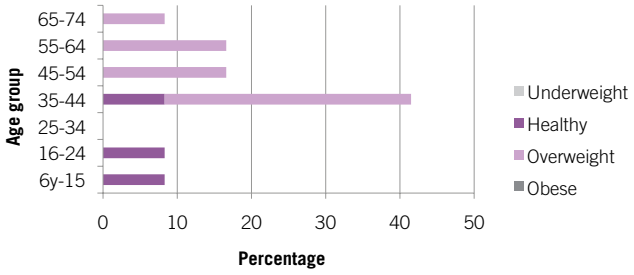


Figure 16

Comparison of BMI in males - end point

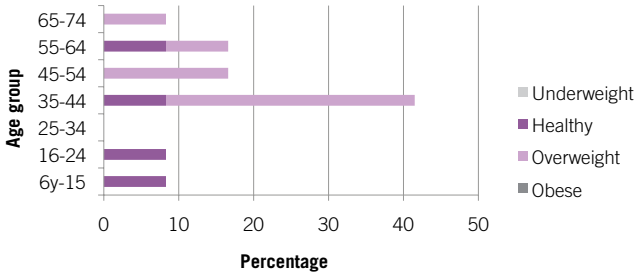


Figure 17

Comparison of BMI in females - start point

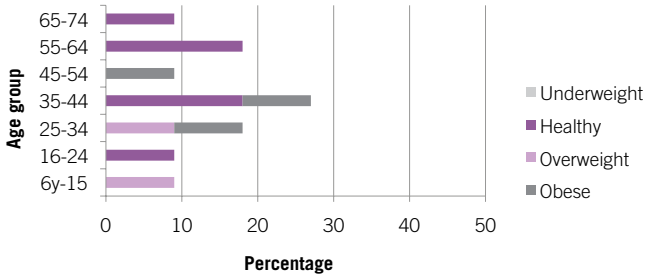


Figure 18

Comparison of BMI in females - mid point

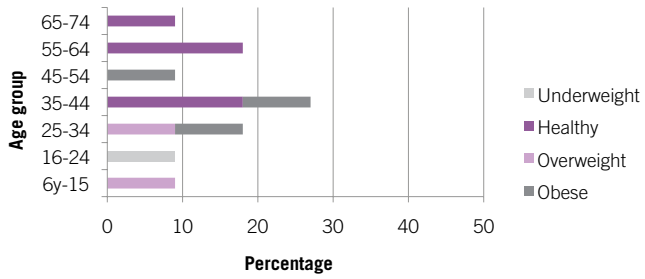


Figure 19

Comparison of BMI in females - end point

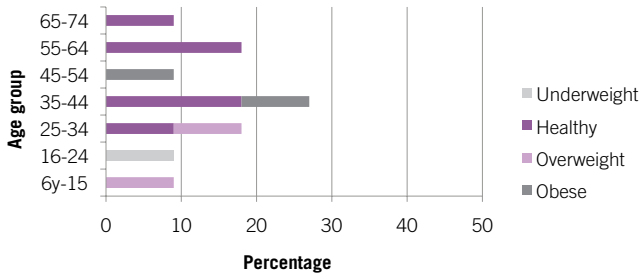


Figure 20

Comparison of waist circumference in males

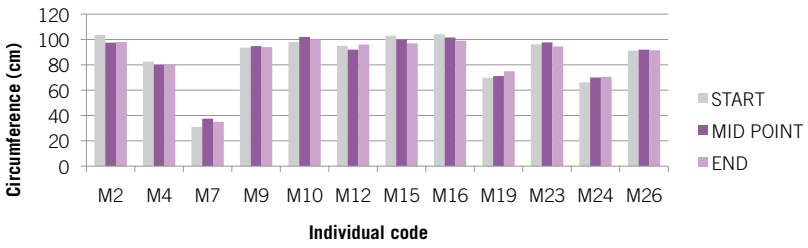


Figure 21

Comparison of waist circumference in females

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