

Health Equity Audit NHS Health Checks in central Lancashire

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FOREWORD

Towards the end of 2010, the newly elected government announced plans for major changes in the commissioning and delivery of health services in the NHS. The Health and Social Care Act 2012 had a stormy passage through parliament, but eventually received Royal Assent on 27 March 2012. The Act confirmed that by April 2013 the Primary Care Trusts (PCTs) and Strategic Health Authorities (SHAs) would be abolished and commissioning responsibilities would be transferred to a range of new organisations.

As part of the preparation for the anticipated transition of responsibilities, a training needs evaluation was undertaken among public health staff in NHS Central Lancashire PCT. This revealed that many staff lacked confidence in epidemiology and needed to increase their knowledge and skills in this key area of public health.

In response, a series of interactive epidemiology sessions for public health staff were provided by Public Health Specialist (Mary Lyons). These were delivered towards the end of 2011 and early in 2012. As a follow up to these taught sessions a learning set was established so that staff could consolidate and apply new knowledge and skills through appropriate work related projects.

The learning sets revolved around two groups, each undertaking a health equity audit linked to their area of work. This report is based on the work of one of these groups.

The learning set was facilitated by Lucinda Cawley, associate director of public health in NHS Central Lancashire who had previous experience of undertaking a health equity audit and participating in a learning set.

This health equity audit of NHS Health Checks in central Lancashire was undertaken by;

- Mary Lyons who came from an academic background in public health and delivered the taught sessions. Mary also had responsibility for the commissioning of NHS Health Checks and was keen to explore issues influencing the equity of this service. Any queries should be addressed to Mary Lyons, who can be contacted on mary.lyons54@virginmedia.com
- Jennifer Paul had responsibility linked to the provision of services for the wider determinants of health. Jennifer was also interested in exploring access to NHS Health Checks.
- Andrea Smith had responsibility for work place health and was particularly interested to find out whether difficulties in attending a GP surgery were creating an inequity by affecting access of members of the working age population to NHS Health Checks.

ACKNOWLEDGEMENTS

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Thanks also to Lucinda Cawley who advised on the use of health equity audit as a public health tool and facilitated the learning set.

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EXECUTIVE SUMMARY

Striving to reduce health inequalities and achieve health equity is at the heart of all public health work. Health equity audit is an established tool that determines whether services are successfully reducing health inequalities.

Following the reorganisation of the NHS in April 2013, Lancashire County Council assumed responsibility for commissioning NHS Health Checks. The Director of Public Health is jointly accountable to the council and the NHS and is responsible for ensuring that NHS Health Checks and all services for the promotion of health and wellbeing are delivered more fairly.

This health equity audit will inform the design of the NHS Health Checks service in Lancashire by advising what the Director of Public Health needs to establish in order to be able to confidently assure the local Health and Wellbeing Board that the programme is being delivered to a high standard and achieving the aim of reducing health inequalities.

The NHS Health Checks programme is a population wide programme designed to provide all healthy people between the ages of 40 – 74 with a health ‘MOT’ every five years. It has many characteristics of a screening programme, but the aim is not to identify disease. Rather the purpose of NHS Health Checks is to recognise those at high risk of developing lifestyle related cardiovascular disease (CVD) diabetes or chronic kidney disease at an early stage, before symptoms develop so that advice and support can be provided to reduce the risk of an early death; or developing serious disease and disability.

NHS Health Checks will only be effective in improving health and reducing health inequalities if the service is marketed effectively so that people understand the benefits and want to attend; and so that those identified at higher risk are adequately supported to change their behaviour.

KEY MESSAGES

1. This health equity audit found inequities in the uptake of NHS Health Checks between men and women. There was also relatively low uptake of NHS Health Checks among those living in areas of high deprivation and vice versa. Provision across central Lancashire was highly variable and inequitable.
2. There are clear benefits to maintaining a GP led service, but equity of access can only be assured if this is supplemented by the commissioning of other providers who can work closely in partnership with GPs.
3. Clear service specifications detailing what each provider is to deliver in relation to number of NHS Health Checks completed and that incorporate incentives and penalties including the option to terminate the contract of any provider who is not performing adequately will also improve equity in access to NHS Health Checks.
4. A systematic (possibly centralised) more modern system for sending out invitations and reminders will create a fairer process and will allow commissioners to monitor uptake against invitations more accurately so they can take appropriate action if this is found to be inadequate or inequitable. Pilot testing of alternate approaches before opting and funding a new system may be advisable. Scrutiny of the way major screening programmes systematically invite patients in may be helpful.
5. Adequate funding for social marketing in general, but particularly to men and those living in some of the more deprived areas should increase knowledge and understanding about NHS Health Checks and increase uptake in the sectors of the population where they are most needed.
6. Commissioners need to be able to assure local councillors, CCGs and other partner organisations that the NHS Health Checks service is reducing health inequalities. The data to inform and measure health outcomes and inequity therefore need to be determined beforehand and processes for the collection and routine monitoring of these data introduced. Quarterly monitoring and an annual report to the Health and Wellbeing Board detailing progress towards reducing inequities in access and uptake of NHS Health Checks rather than just numbers invited or NHS Health Checks undertaken would provide suitable accountability.
7. Action to improve equity in the provision and uptake of NHS Health Checks will benefit CCGs by reducing the impact of many of the costly long term conditions that are amenable to prevention through early identification and lifestyle changes. Including GPs and CCGs into the decision making processes for the development of the NHS Health Checks service will encourage local participation and engagement.

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INTRODUCTION

EQUITY AND EQUALITY

In his introduction to the summary report 'Fair Society, Health Lives' Marmot suggests that reducing health inequalities should be at the centre of all health work. He says "People with higher socioeconomic position in society have a greater array of life chances and more opportunities to lead a flourishing life. They also have better health. The two are linked: the more favoured people are, socially and economically, the better their health. This link between social conditions and health is not a footnote to the 'real' concerns with health – health care and unhealthy behaviours – it should become the main focus." (M. G. Marmot, 2010).

For public health professionals, reducing health inequalities has long been regarded as a fundamental principle to guide the activities they organise. In the 'World Health Report for 1998: Life in the 21st Century: A vision for all', public health is defined as "The art of applying science in the context of politics so as to reduce inequalities in health while ensuring the best health for the greatest number" (World Health Organization, 1998).

Equality can be measured objectively and infers equal distribution of a resource, but equity refers more to the concept of fairness linked to need. Health equity is described as "Differences in opportunity for different population groups which results in unequal life chances, access to health services, nutritious food, adequate housing and so on. These can lead to health inequalities" (Hamer, Jacobson, Flowers, & Johnstone, 2003). Equity is not easily measured because fairness is linked to policies and decisions based on moral judgments rather than objective data. Equity can only be determined by exploring who is in need or at risk and then making decisions about how groups can be provided with their fair share of resources.

"**Equity** involves trying to understand and give people *what they need* to enjoy full, healthy lives. Equality, aims to ensure that everyone gets the same things in order to enjoy full, healthy lives. Like equity, **equality** aims to promote fairness and justice, but it can only work if everyone starts from the same place and needs *the same things*" (Clow, Hanson, & Bernier, 2009).

The NHS was based on the concept of equality. It was originally designed to provide everyone in the country with access to health care and services regardless of their ability to pay for care. However, providing services that are open to all and free at the point of

delivery is not enough to reduce health inequalities. Some people live with social, political and economic disadvantages that contribute to poor health. They may need different services and programmes, or for services to be organised differently so that they are more accessible to offset the impact of the disadvantages.

“Health inequalities can be defined as differences in health status or in the distribution of health determinants between different population groups. For example, differences in mobility between elderly people and younger populations or differences in mortality rates between people from different social classes. It is important to distinguish between inequality in health and inequity. Some health inequalities are attributable to biological variations or free choice and others are attributable to the external environment and conditions mainly outside the control of the individuals concerned. In the first case it may be impossible or ethically or ideologically unacceptable to change the health determinants and so the health inequalities are unavoidable. In the second, the uneven distribution may be unnecessary and avoidable as well as unjust and unfair, so that the resulting health inequalities also lead to inequity in health” (World Health Organization, 2013).

HEALTH EQUITY AUDIT

“Health equity audit is a process for identifying how fairly services or other resources are distributed in relation to the health needs of different groups and areas; and the priority action to provide services relative to need. The overall aim is not to distribute resources equally but, rather, relative to health need. This process assists the planning and decision-making processes of organisations. It determines whether the distribution of health outcomes, healthcare or the determinants of health are inequitable or unrelated to need, and action is then taken to remedy and monitor progress. The purpose is for health and other services to help narrow health inequalities by taking positive decisions on investment, service planning, commissioning and delivery that narrow inequalities” (Quigley, 2005).

Health equity audit is a tool that has been developed to provide a framework for groups or organisations who wish to explore the impact of services on equity and health inequalities.

Resources for health are limited and failure to consider equity when services are being commissioned, developed and delivered can result in an inadvertent increase in health inequalities instead of a decrease. In their 2003 review of the evidence Anna Dixon, Julian le Grand and others said that “There is strong evidence from many studies of specific NHS services, that lower socio-economic groups use services less in relation to need than higher ones. These include cardiac, diagnostic and surgical care ... and diabetes clinics and diabetes reviews” (Dixon, 2003). The NHS itself has contributed to widening health inequalities, since its services are used more freely and public health advice adopted more readily by those with higher socioeconomic status who are already experiencing better health than those living in poverty who have the greatest health needs.

Although it might sound counterintuitive, programmes and services that promote good health may inadvertently lead to an increase in health inequalities unless they are set up and monitored to ensure equity.

NHS HEALTH CHECKS IN CENTRAL LANCASHIRE

'NHS Health Checks' is a national programme inviting healthy people aged 40 to 74 years to come for a health 'MOT' once every five years. The overarching aim is to detect and reduce the risk of heart disease, stroke, type 2 diabetes and chronic kidney disease in the population. These are conditions that are more common among the socially disadvantaged in society (Buck & Frosini, 2012). NHS Health Checks aim to promote individual wellbeing and to deliver a service that decreases health inequalities in the population.

The NHS Health Check itself involves basic anthropomorphic measurements such as height, weight and blood pressure; recording of family history; questions about lifestyle such as smoking status and a simple blood test for cholesterol. If someone is estimated to be at high risk for diabetes or chronic kidney disease, then additional blood tests for glucose or HbA1c, or urea and electrolyte levels are undertaken.

Once all the results are collated, data are entered into a computer based algorithm (JBS2 was used in Central Lancashire, alternate algorithms are available) and a score is produced, indicating that person's risk of cardiovascular disease over the next ten years. Risk is considered high if it is over 30 percent, moderate if it is between 20 and 30 percent and low if it is less than 20 percent.

Everyone attending for a NHS Health Check should have their risk score explained, be given their own health plan and offered appropriate advice and health messages. Those at low risk are encouraged to continue healthy activities and to modify any behaviour that could increase health risk in later years. Those at moderate or high risk are offered more specific tailored advice and / or referral into specialist behaviour change services. Anyone at high risk or who is identified as possibly having a cardiovascular related condition or diabetes should be referred to the GP and offered appropriate treatment such as lipid modification to reduce risk. Usual care pathways for the particular problem should be implemented and the individual is excluded from future NHS Health Checks.

NHS Health Checks are not included in the main GP contract and in central Lancashire all GPs could choose whether or not to offer the service detailed in a local enhanced service (LES) contract. GPs who signed the contract were remunerated by the PCT with £20.00 per patient for those found to be at high risk, and £16.00 for those at low or moderate risk on completion of their NHS Health Check. The greater fee for those at high risk was provided in recognition of the additional time and work required to refer patients on to lifestyle services and provide appropriate advice, and as an incentive to encourage GPs to select (or not

avoid) patients with the greatest need and potential to be high risk. Payment was made retrospectively based on the actual number of NHS Health Checks completed.

The service specification provided considerable flexibility so that the GPs could organise the service in a way that suited them and the way they work. In most practices, the NHS Health Checks were carried out by the practice nurse. Although in some of the more successful practices (in relation to achieving targets for numbers completed) the NHS Health Checks were conducted by trained health care assistants. In several practices, invitations were not sent out in any systematic way, but were provided 'opportunistically' whereby anyone who met the criteria and came into the surgery for any other reason would be offered a NHS Health Check on the spot or more likely invited to make an appointment to return at a later date.

The introduction of the NHS Health Checks programme represented an important step in encouraging prevention in a primary care setting and one of its aims was to reduce health inequalities by decreasing the risk of premature deaths and disability associated with long-term conditions which are more prevalent in disadvantaged groups. Full details can be found on the NHS Health Check website (www.healthcheck.nhs.uk).

THE POPULATION OF CENTRAL LANCASHIRE

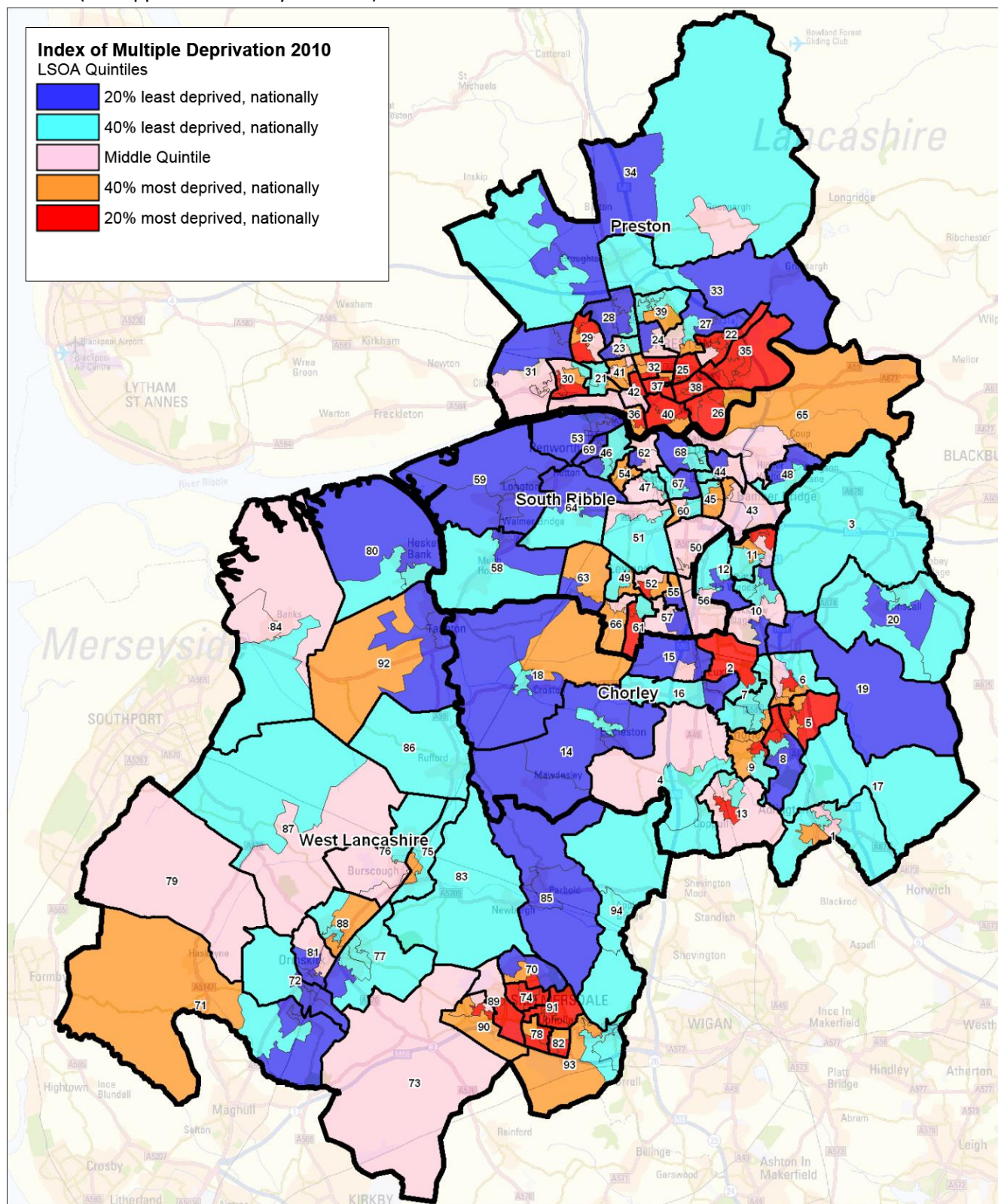
The Lancashire Directors of Public Health Report 2010/2011 identified ten priority health outcome areas where the health gap between deprivation groups was the largest (Atherton, Bhatti, & Morris, 2012). These included:

- **Diabetes:** those living in the most deprived areas are 4.1 times more likely to die prematurely than those in least deprived areas;
- **Coronary heart disease:** those in the most deprived areas are 2.8 times more likely to die prematurely than those in least deprived areas;
- **Stroke:** those in the most deprived areas are 2.7 times more likely to die prematurely than those in the least deprived areas.

The reasons why these largely preventable conditions are more likely to kill those who live in deprived areas are complex. NHS Health Checks were intended to play an important part in reducing these inequalities by providing tailored advice and support to those who have an increased risk, but this will only be effective if those with the greater need access the service and are able to act on the advice proffered and change their lifestyle.

Map 1 Index of Multiple Deprivation 2010 showing ward boundaries

(See appendix 1 for key to wards)



Central Lancashire has a population of approximately 457,900 over the four districts of Chorley, Preston, South Ribble and West Lancashire. The communities across central Lancashire are varied and whilst levels of deprivation are average overall, there are distinct neighbourhoods that experience high levels of deprivation.

Although the proportion of the population in central Lancashire coming from black or minority ethnic (BME) backgrounds is lower than the England average, there is a large BME community (predominantly Asian British and Indian) living in the inner city area of Preston.

Map 1 shows the wards where there are high levels of deprivation. These are mainly located in the inner city areas of Preston, and parts of Chorley and Skelmersdale.

In central Lancashire, cardiovascular disease is one of the biggest killers among those under 75 years of age, with an increased risk for the people living in areas of high deprivation. Cardiovascular and related diseases such as diabetes shorten lives, affect the quality of everyday life and most importantly, are largely preventable.

Diabetes is a chronic disease affecting the ability to regulate blood glucose. People with diabetes are up to five times more likely to have cardiovascular disease and stroke than the general population (Diabetes UK, 2012). In England, in 2011, people with type 2 diabetes were 36.4 percent more likely to die than those without the disease (Health and Social Care Information Centre, 2012c). Good control of diabetes reduces the risk of death or complications.

In central Lancashire in 2012, there were 23,553 people aged 12 and older registered as diabetic. The majority of these were adults with type 2 diabetes but some were children under 16 years of age with type 1 diabetes. The 2012 estimated prevalence of diabetes (both diagnosed and undiagnosed) in those aged 16 and over was 28,504 (Yorkshire and Humber Health Intelligence, 2012). This means that in 2012 there were likely to be at least 4951 cases of undiagnosed diabetes in central Lancashire. If current trends continue, by 2030, this will increase and almost 10 percent of the population will be diabetic with approximately 90 percent of these cases being type 2 diabetes.

Cardiovascular disease is caused by reduced blood flow to the heart, brain or body caused by atheroma or thrombosis and is common in people aged over 60. The main types of CVD are coronary heart disease (CHD) and stroke. Many of the associated deaths and particularly those in the younger age groups are preventable. Although the standardised death rate among those under 65 years of age reduced by more than a half between 1993 and 2010, cardiovascular disease remains the main cause of death in adults.

Amenable mortality can broadly be defined as deaths occurring before age 75 from causes that are considered responsive to medical intervention and include cardiovascular disease and many cases of diabetes (Wheller L, Baker A, Griffiths C, & Rooney C, 2007). On average between 2008 and 2010 in central Lancashire there were 1,121 deaths per year from

cardiovascular disease among those aged less than 75 years, giving a directly standardised rate of 70.36 per 100,000 population (Health and Social Care Information Centre, 2012a). This is higher than the average for England and Wales of 67.78 per 100,000 over the same time period. However, the average figure masks huge variations that exist between genders and geography in the area from a high of 118.44 deaths per 100,000 males aged under 75 in Preston to 48.24 deaths per 100,000 among females in South Ribble over the same period (Health and Social Care Information Centre, 2012a).

Between 2008-10, the average death rate for stroke among those under 75 years of age was 14.00 per 100,000 population in central Lancashire, which is higher than the average for England and Wales of 12.30 per 100,000 (Health and Social Care Information Centre, 2012b).

Supporting individuals to help them manage their risk of developing cardiovascular disease and type 2 diabetes and identifying undiagnosed cases are essential elements of the NHS Health Check programme. It is important for those identified at moderate or high risk to receive the maximum benefit that early diagnosis and treatment will bring.

NHS Health Checks have been offered in central Lancashire since 2009 and have the potential to reduce inequalities in health. Commissioners felt that the greatest benefit would come from providing NHS Health Checks to younger age groups and those living in areas of higher deprivation and encouraged practices to target these groups.

Practices were asked to offer NHS Health Checks to 20 percent of their eligible population every year, so that over a period of five years all those eligible would be invited. Department of Health anticipated that uptake would be about 50 percent of those invited. Patients are not eligible for a NHS Health Check if they have existing heart disease, diabetes, kidney disease or hypertension, have had a stroke or are already on a CVD high risk register.

AIM OF THE HEALTH EQUITY AUDIT

To explore whether NHS Health Checks are being delivered equitably across the NHS Central Lancashire footprint and make recommendations about how the NHS Health Checks programme could be redesigned to reduce health inequalities.

OBJECTIVES

1. Identify groups that received and NHS Health Check in 2010/11 by age and gender
2. Identify uptake of NHS Health Checks by Mosaic and geographical area

METHODS

The NHS Central Lancashire Primary Care Trust (PCT) footprint was the geographical boundary to this audit, encompassing Preston, South Ribble, Chorley and West Lancashire areas.

On a quarterly basis, the PCT data quality team provided the public health commissioning team with information for each practice. This included the number of eligible patients and the number of NHS Health Checks undertaken with risk stratification.

In April 2011, central Lancashire moved over to a system based on 'Open Exeter' for paying practices for NHS Health Checks completed. This provided an opportunity to analyse (anonymised) individual patient data. Practices provide LaSCA with data about each NHS Health completed such as name, NHS number, date the NHS Health Check was undertaken and the result of the risk assessment. Staff at LaSCA collated the data and provided PCT staff a spread sheet containing information about sex, age, partial postcode, general practice and lower level super output area for each patient that had a NHS Health Check between April 2011 and end of March 2012.

Therefore, data were taken from two main sources. The first source was practice based data collected by the programme team every quarter. The second source was from LaSCA who provided anonymised individual patient data.

The research and development unit in the Primary Care Trust confirmed that formal ethical committee approval would not be needed. Information governance advice was sought and although individual patient data was received from LaSCA, this was anonymised before being sent to the PCT staff and individual patients could not be identified.

Data were mapped and analysed according to age, sex and deprivation wherever possible. Odds ratios (with 95% confidence intervals) were produced to compare uptake in males with females. Lack of adequate data seriously reduced the ability of the authors to undertake accurate analysis of health equity in these and any other dimensions.

RESULTS

All results refer to data collected for 2011/12.

There were 85 practices in the NHS Central Lancashire footprint and 77 of these agreed to offer NHS Health Checks as a local enhanced service (LES) and in this year 11,206 people received a NHS Health Check.

There were 127,031 individuals eligible for a NHS Health Check in central Lancashire. Eight practices chose not to provide this service and a further four practices did not deliver any NHS Health Checks in year, resulting in 13,705 eligible patients who were in effect excluded from the programme and the benefits it offers.

Numbers of NHS Health Checks completed and offered varied by practice, ranging from 1 to 607 for completed and from 1 to 1192 for offered. The target for the proportion of the eligible population to be offered a NHS Health Check was 20 percent but there was no set target for proportion completed. Originally the Department of Health (DH) had suggested that 75 percent of those eligible (i.e. 15 percent of total eligible per year) would be reasonable. In 2012 this was reduced to a more realistic 50 percent of those invited (i.e. 10 percent of total eligible). In NHS Central Lancashire, as a percentage of those eligible, coverage varied between practices from 0.17 to 35.62 percent. Frequency data were skewed with a relatively large number of practices undertaking very few NHS Health Checks during the year. The median coverage for the practices that actively participated was 9.55 percent with an interquartile range going from 6.01 to 13.45 percent. In 14 practices, coverage was less than 5 percent. The practices with relatively high coverage tended to be those that had recently started offering the service who found it easy to provide a NHS Health Check opportunistically to anyone eligible who visited the surgery.

There was a slight discrepancy in numbers between the data provided by LaSCA and the data collected by the PCT. According to LaSCA, 10,297 NHS Health Checks were completed, but according to the PCT data 11,206 NHS Health Checks were completed. LaSCA data are based on claims submitted by practices and especially since this was the first year operating this system, some practices did not submit timely claims for all the activity completed. The PCT data were thoroughly checked and were considered likely to be more accurate. Much of the difference can be explained by one practice that carried out over 400 NHS Health Checks, but did not submit their data through LaSCA. This claim was eventually processed separately, but too late for the data to be included in this audit. Other differences were relatively minor.

Table 1 Numbers of NHS Health Checks completed by age group (LaSCA data for 2011/12)

Age group	Male		Female		Total Number
	Number	(%)	Number	(%)	
40-44	997	46.20	1161	53.80	2158
45-49	944	47.04	1063	52.96	2007
50-54	788	46.68	900	53.32	1688
55-59	721	45.63	859	54.37	1580
60-64	646	46.98	729	53.02	1375
65-69	438	43.93	559	56.07	997
70-74	208	42.28	284	57.72	492
Total	4742	46.05	5555	53.95	10297

Table 1 shows that there are more females than males receiving a NHS Health Check in each age group. The difference between the sexes appears to be consistent.

The following figures relate to individuals who actually attended a practice for a NHS Health Check in 2011/12.

Figure 1 Numbers attending for a NHS Health Check by age group and sex (LaSCA data for 2011/12)

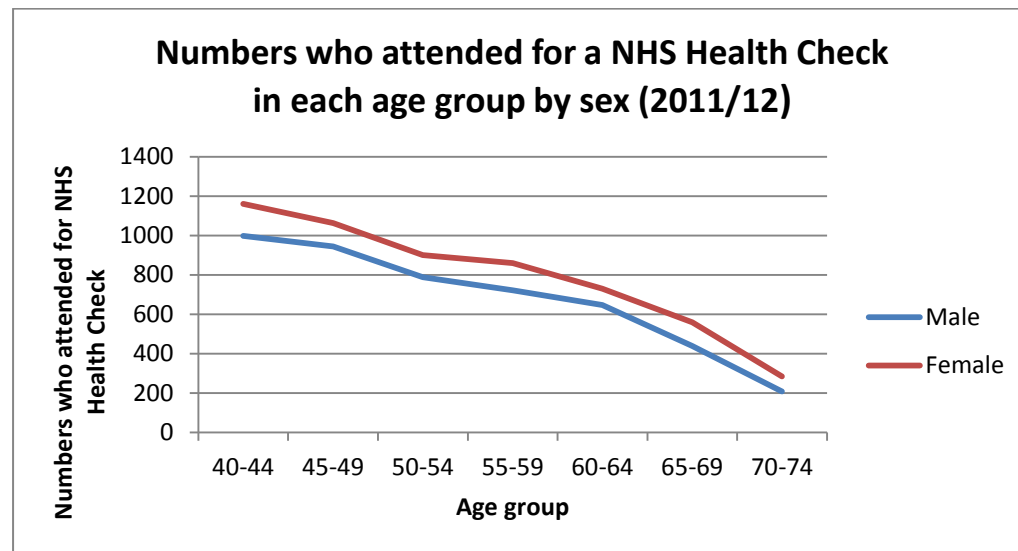


Figure 1 indicates how numbers attending decreases with age. The proportion of males to females appears to remain relatively constant in each age group.

Figure 2 Odds ratio for uptake of NHS Health Checks (females:males) by population (LaSCA numerator data for 2011/12)

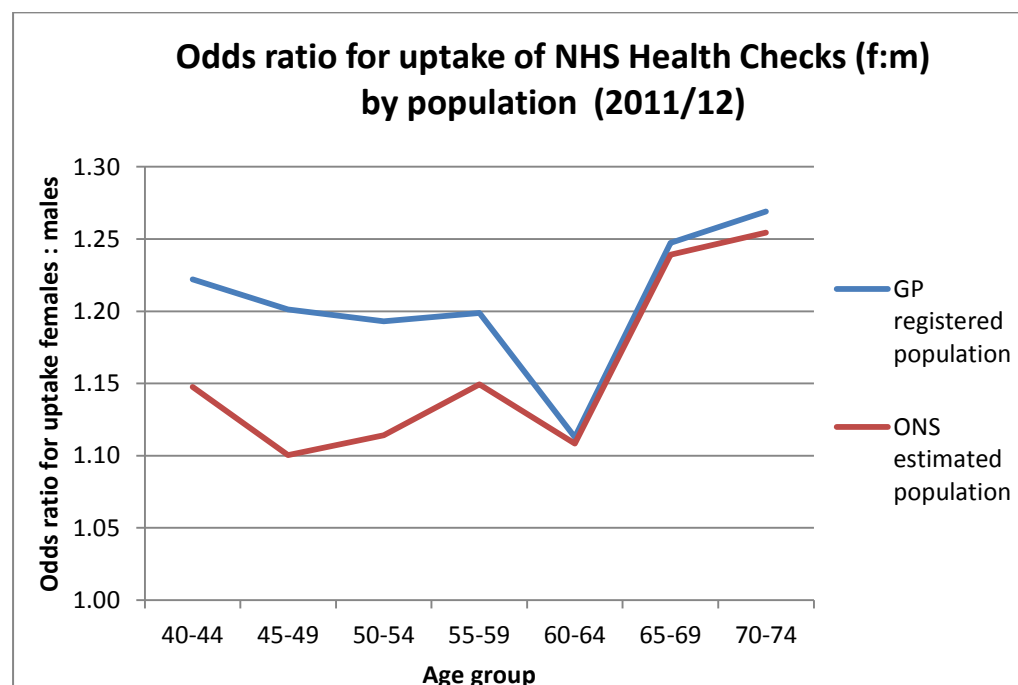


Table 2 Odds ratio (with 95% confidence intervals) for uptake of NHS Health Checks (females:males) by population (LaSCA numerator data for 2011/12)

Age group	GP registered population			ONS registered population		
	Odds ratio	Lower 95% confidence interval	Upper 95% confidence interval	Odds ratio	Lower 95% confidence interval	Upper 95% confidence interval
40-44	1.22	1.12	1.33	1.15	1.05	1.25
45-49	1.20	1.10	1.31	1.10	1.01	1.20
50-54	1.19	1.08	1.32	1.11	1.01	1.23
55-59	1.20	1.08	1.33	1.15	1.04	1.27
60-64	1.11	1.00	1.24	1.11	0.99	1.24
65-69	1.25	1.10	1.42	1.24	1.09	1.41
70-74	1.27	1.06	1.52	1.25	1.05	1.50

Figure 2 shows how the odds ratio for uptake in females compared to males varied depending on whether the GP registered population or the ONS population estimates were used as the denominator. Table 2 shows that the difference between odds ratios based on whether the GP or the ONS registered population were used were not statistically different for any age group. Irrespective of which denominator is used, Table 2 shows that in all except the 60 – 64 year age group, women were significantly more likely to receive a NHS Health Check than men.

Map 2 Numbers attending for a NHS Health Check by Lower layer Super Output Area (LSOA) of individual (LaSCA data for 2011/12)

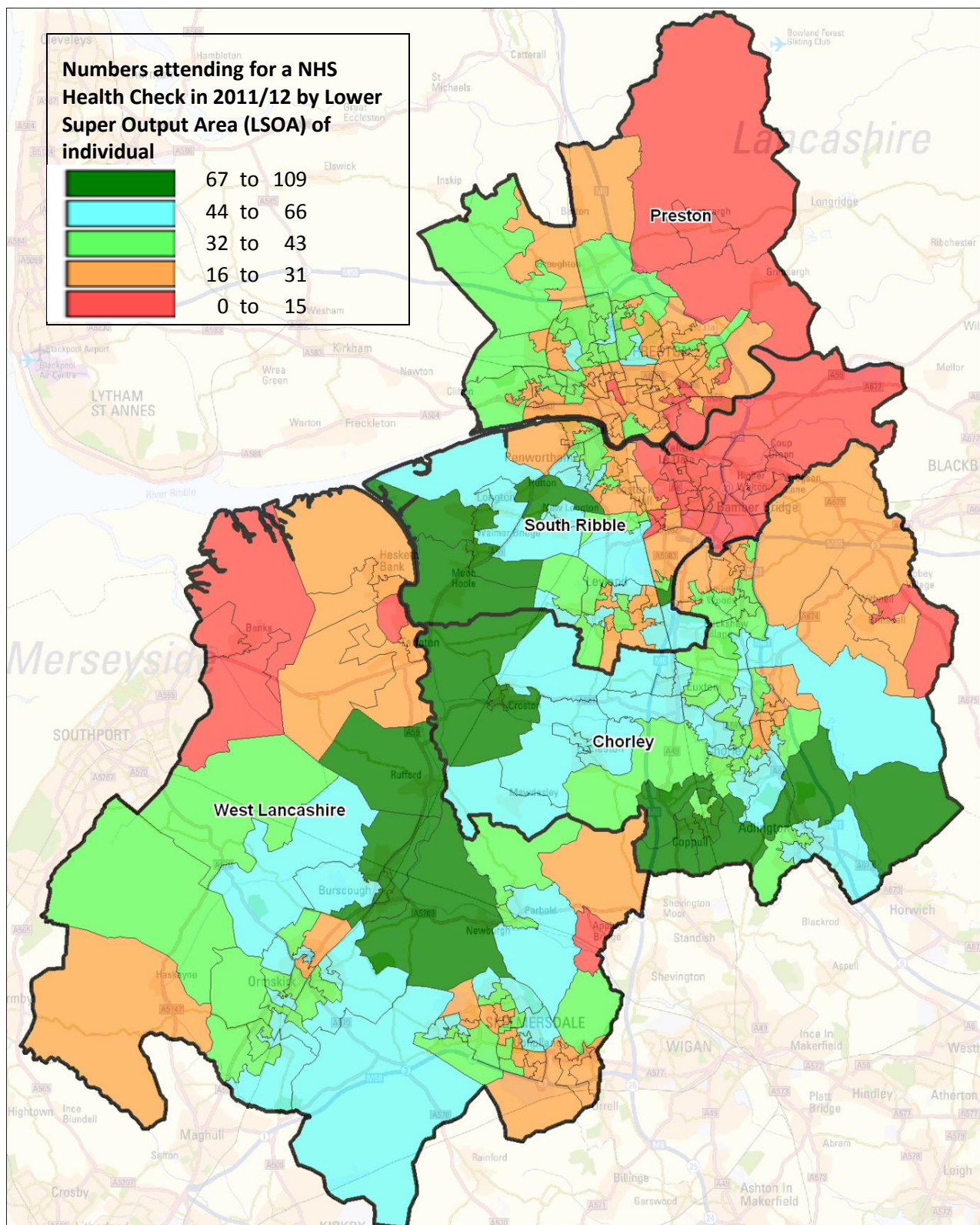


Figure 3 Risk by age group (males and females) (LaSCA data for 2011/12)

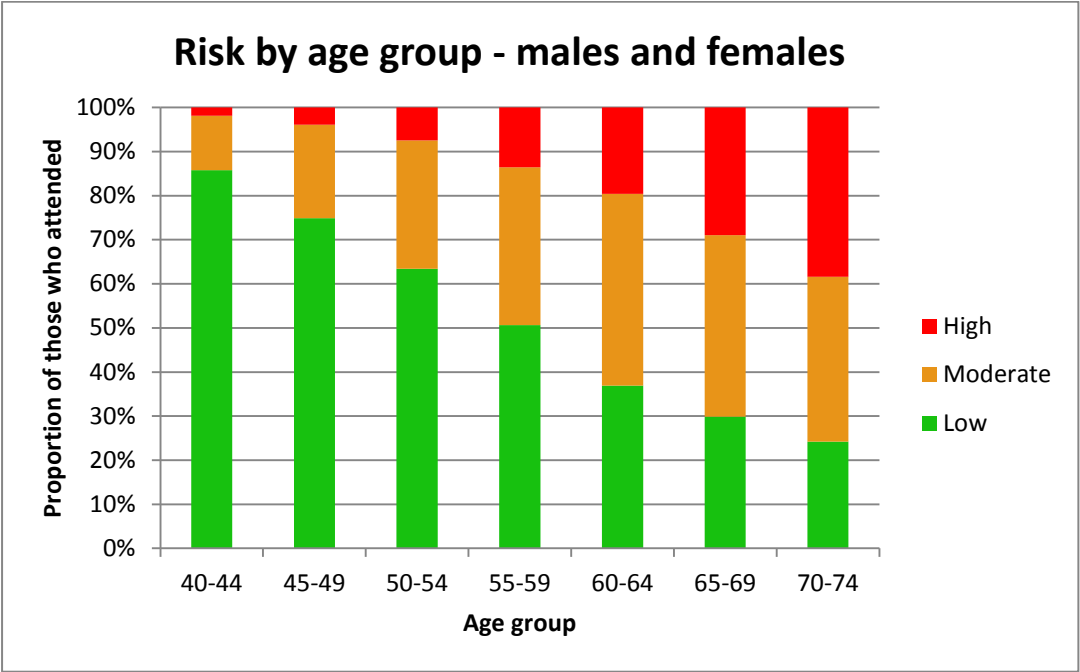


Figure 3 Shows how the proportion of those identified as high risk increases with age.

Figure 4 Risk by age group in males (LaSCA data for 2011/12)

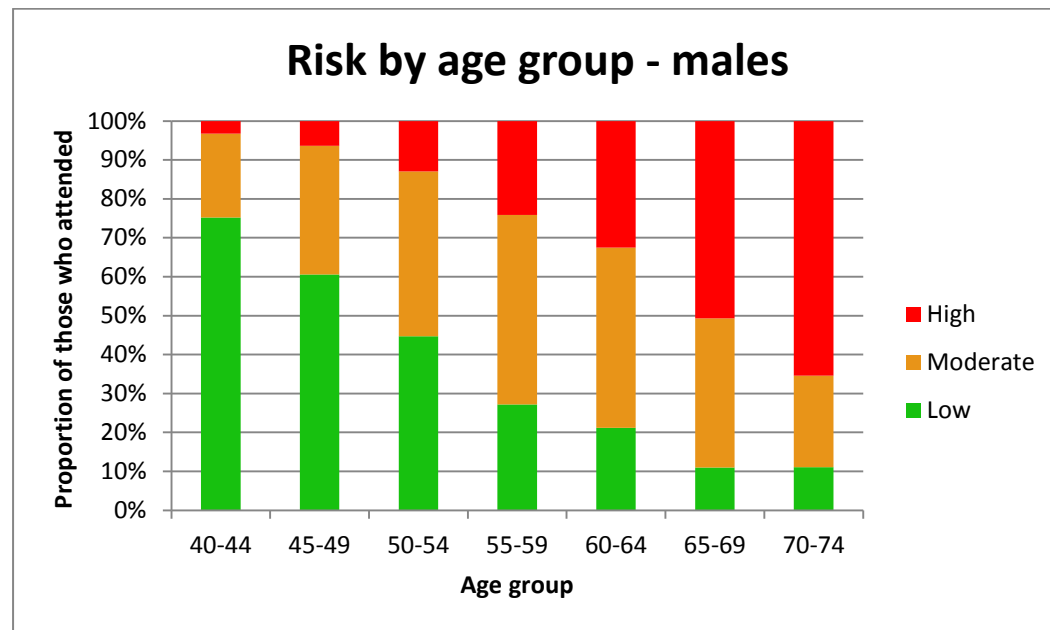


Figure 5 Risk by age group in females (LaSCA data for 2011/12)

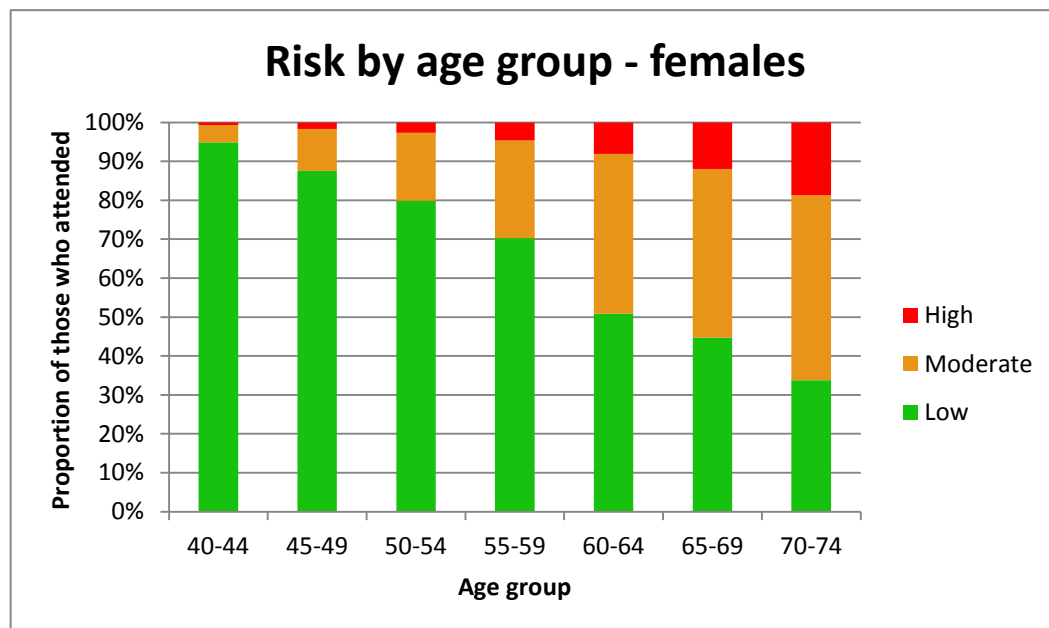


Figure 4 (Males) and Figure 5 (females) show how risk varies with age, with a considerably higher proportion of males in the older age groups identified who are at high risk.

Figure 6 Population eligible for a NHS Health Check, by IMD quintile of GP (LaSCA data for 2011/12)

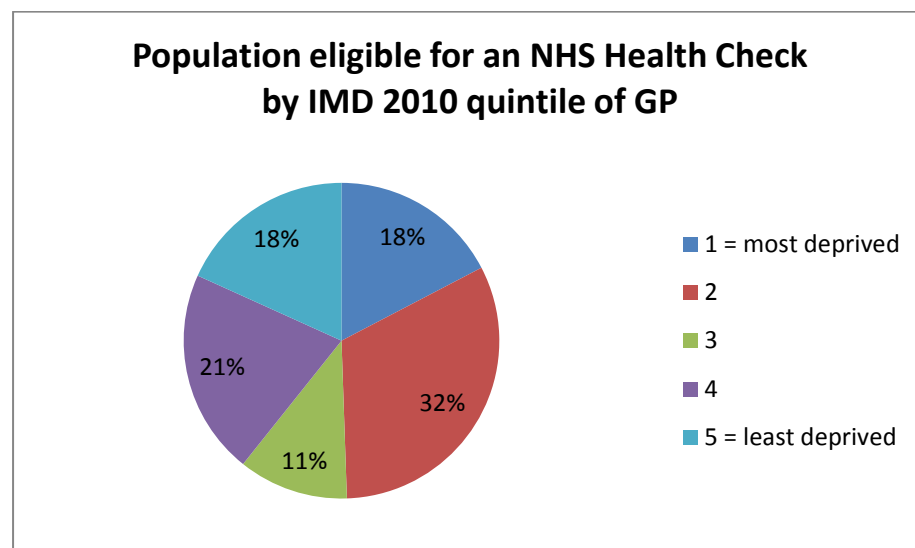
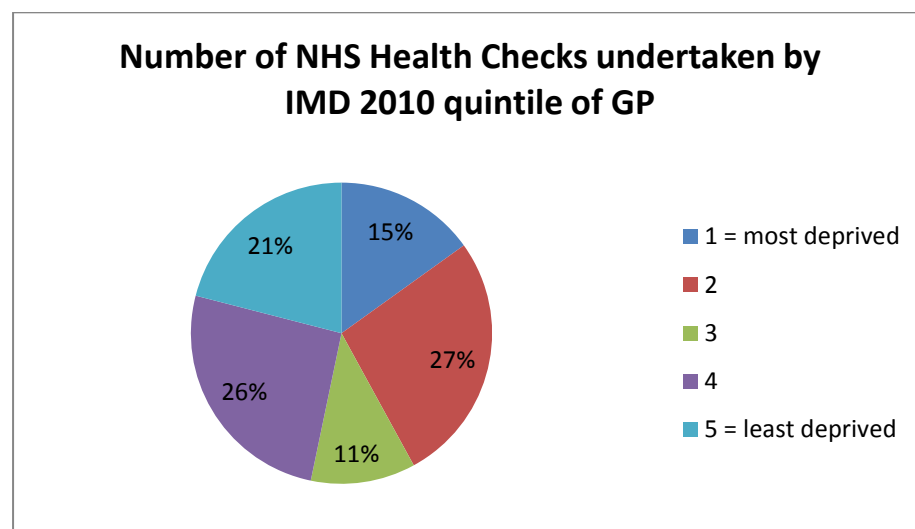


Figure 7 Number of NHS Health Checks undertaken, by IMD quintile of GP (LaSCA data for 2011/12)



By comparing Figure 6 with Figure 7 it is clear that proportionately fewer people in the more deprived quintiles (especially quintile 2) are attending for a NHS Health Check whilst proportionately more are attending in the more wealthy quintiles.

Figure 8 Percent of eligible population who received a NHS Health Check by IMD2010 quintile of GP (LaSCA data for 2011/12)

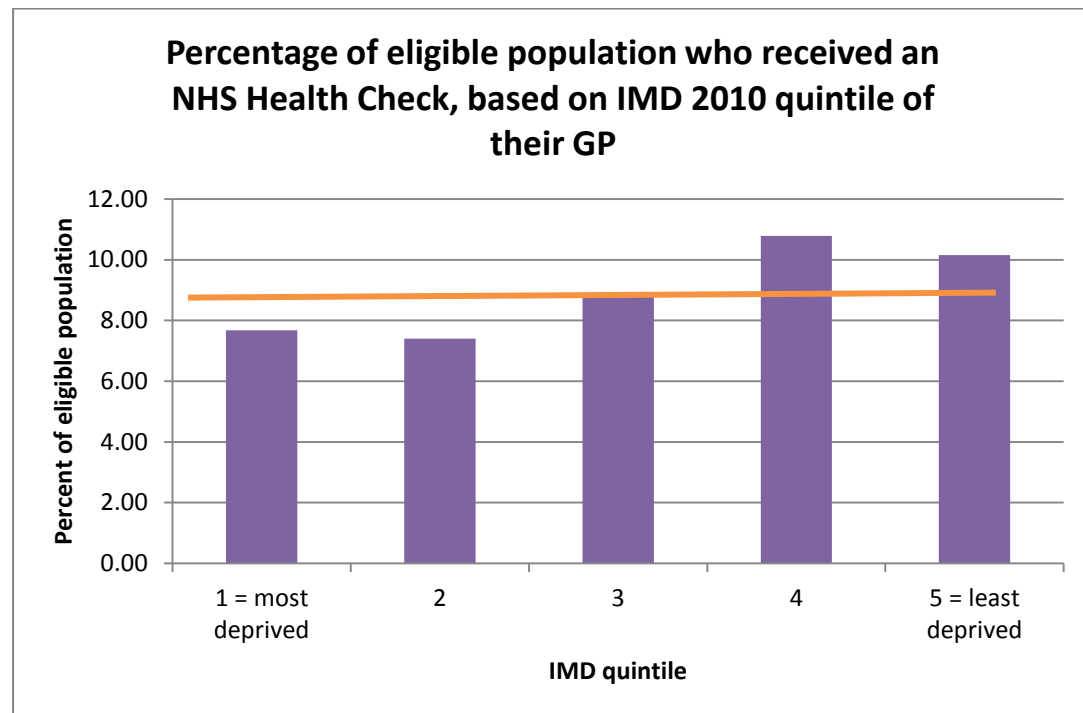


Figure 8 shows that based on IMD 2010 quintile of the GP, a lower proportion of those who are eligible and live in a deprived area received a NHS Health Check. The orange line represents the average uptake, which was 8.82 percent. This was achieved by those in quintile 3.

Map 3 Proportion of all those who attended for a NHS Health Check in each ward who were found to be a high risk

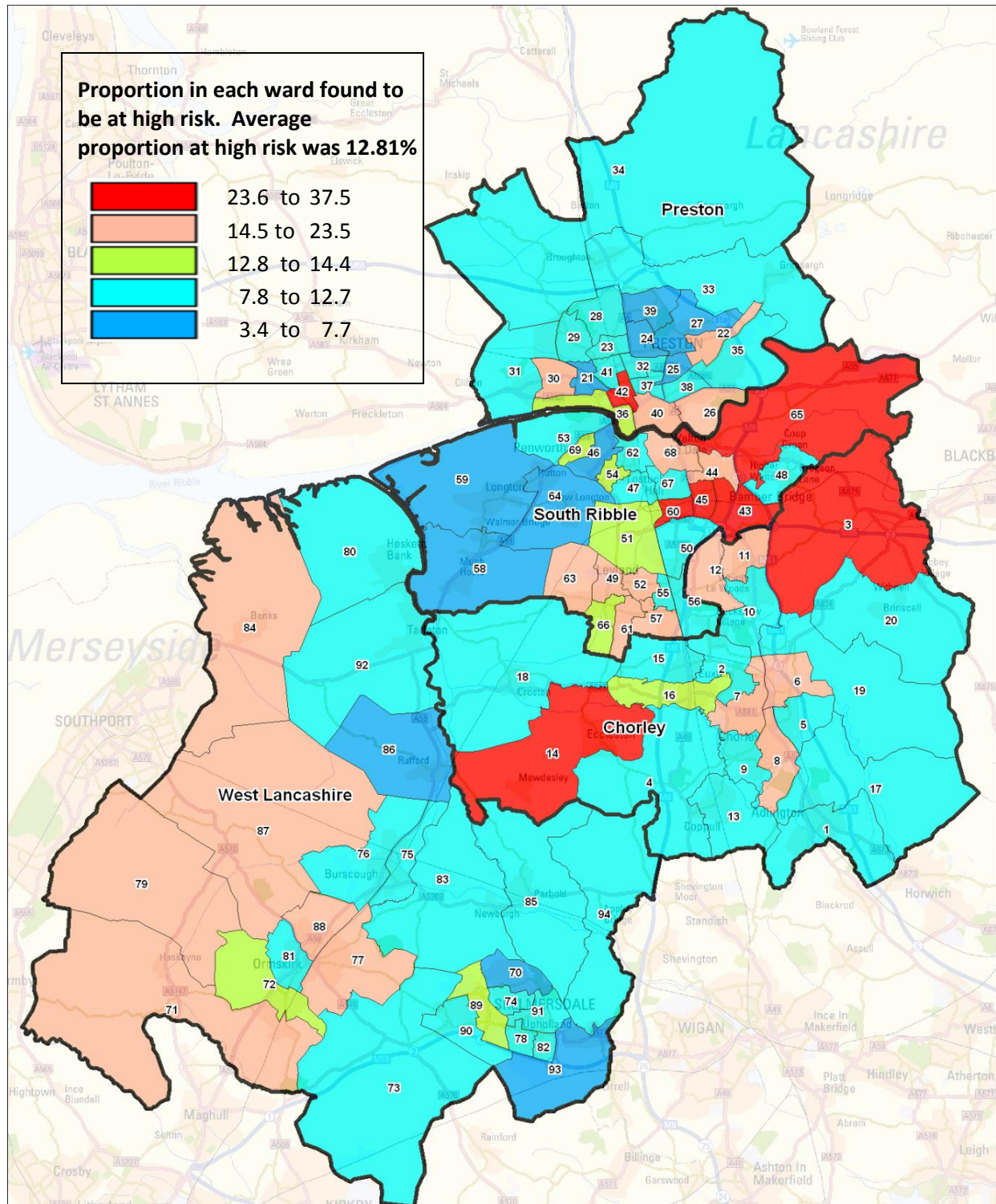


Figure 9 Risk outcomes for patients based on IMD quintile of their GP (LaSCA data for 2011/12)

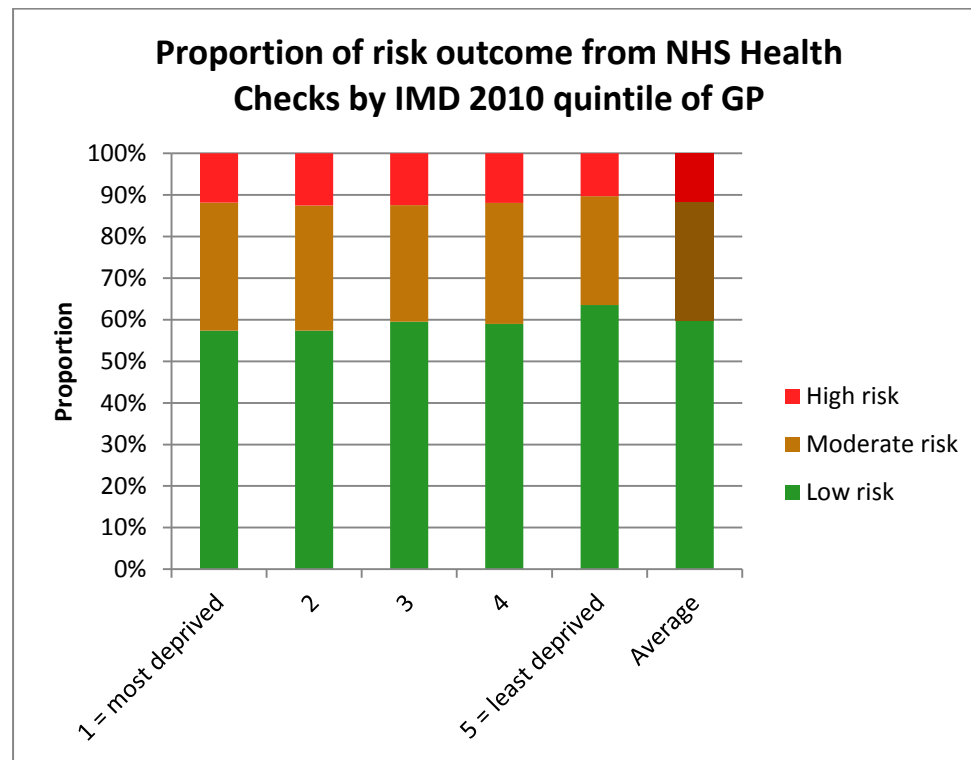


Figure 9 appears to show very little variation in risk profile based on IMD quintile of the patient's GP.

Figure 10 Age and sex chart of most common causes of death in central Lancashire, (2005 – 09)

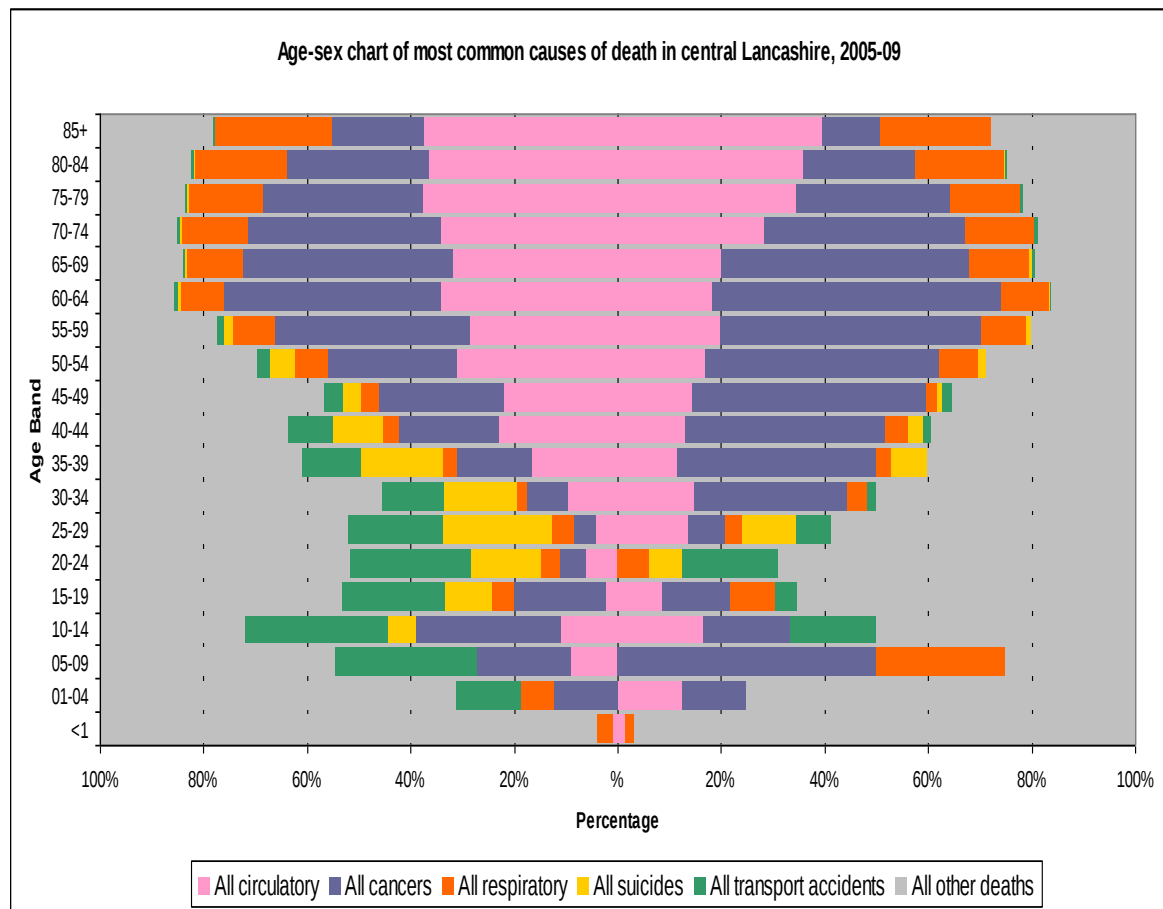


Figure 10 shows that as a proportion of all deaths, cardiovascular disease in women is lower than in men. After 70 years of age, women start to 'catch up'; although it is not until the age of 80 and above that cardiovascular disease has a greater impact (as a proportion of all deaths) on women compared to men

DISCUSSION

Most health data about central Lancashire suggest that in many ways it is average, but closer inspection reveals quite important variations. For example, in 2011 directly age and sex standardised potential years of life lost per 100,000 population for causes considered amenable to healthcare among males in Greater Preston was 2521.0, compared to 1765.0 among women in Chorley and South Ribble (Health and Social Care Information Centre, 2013).

In this health equity audit, we aim to identify how the NHS Health Checks programme is addressing some of the health inequalities that exist in central Lancashire or how it might have contributed to increasing them.

There are many arguments about whether programmes that aim to identify (and then treat) those at high risk are cost effective especially when compared to total population programmes (Capewell & Graham, 2010). It is not the remit of this health equity audit to debate this, but some recently published research found that NHS Health Checks were effective in reducing estimated CVD risk in the local population (Cochrane et al., 2012) and further evaluation work in this area is being carried out nationally.

INVITATION

The first inequity to note is that the programme was not available to all those eligible. It was set up as a local enhanced service to be offered by those GPs who chose to provide this service and 10.8 percent of the eligible population were excluded because their GP did not provide the service. Several of those who decided not to offer NHS Health Checks cited lack of space; that they did not have the staff or other resources to run the programme; or that the remuneration offered did not cover the outlay required to run the programme.

In central Lancashire, some funding was provided to promote NHS Health Checks in 2009 when the programme was initially established, but no further money was provided to support the marketing of NHS Health Checks. In 2011/12 records indicate that 67.7 percent of those offered a NHS Health Check took up the offer and received a NHS Health Check. However, many practices did not record invitations accurately, so this is an overestimate and the true figure is certainly much lower than this. This suggests that about four out of every ten people invited ignored the offer. This clearly indicates a need to improve the 'marketing' of NHS Health Checks so that people understand why it is important to attend when invited.

In 2011/12 the majority (91 percent) of practices agreed to offer NHS Health Checks and 33 practices provided a NHS Health Check to 10 percent or more of their eligible population but 44 practices did not achieve this target.

During 2011/12 a small survey of practices was undertaken and a series of training sessions were provided for staff involved with the NHS Health Checks programme in Central Lancashire. This provided an opportunity to discuss issues faced by the staff who were running the programme. Several practice managers said that the funding offered was insufficient to cover postage to send out invitations, or that they could only afford to send out one invitation with no reminder for those who did not respond. Some practices were inviting people by telephone, but this was mainly as a reminder to those who had failed to respond to an initial letter. Practice staff also felt that the recommended letter was unattractive and although factually correct was not very appealing to many people. They reported that they would welcome assistance to improve the way people are invited to attend.

AGE, SEX, GEOGRAPHY AND RISK

Figure 1 shows that there were more females than males attending for a NHS Health Check and that this difference remained consistent across all ages groups. Numbers attending were higher in the younger age groups and went down as age increased. The likelihood of someone having a long term condition that would make them ineligible for a NHS Health Check increases with age, so the observed drop in numbers attending as age increased was expected.

There was a suggestion that those of working age might find it difficult to respond to an invitation for a NHS Health Check, since many would have to take time off to go to their GP on at least one and possibly more occasions. However, the average age of those attending for a NHS Health Check was 53.3 years, and our data provided no evidence that those of working age were less likely to attend for a NHS Health Check than others. However, the age breakdown for the eligible population was not available, nor were details of any individual's employment status. We cannot therefore confidently suggest that difficulty in accessing a GP for those who are working outside the home had any impact on uptake of NHS Health Checks.

It would be incorrect to assume from Figure 1 that there is sex inequity in uptake of NHS Health Checks, since this variation could possibly reflect gender differences in the eligible population. Data about the age and sex breakdown of the eligible population were not available. There are several possible explanations for the variation in uptake of NHS Health Checks observed between the sexes. Figure 10 shows that at younger ages proportionately more males than females die from cardiovascular disease. Cardiovascular disease affects proportionately more males than females in the younger age groups and anyone with known cardiovascular disease or diabetes is ineligible for a NHS Health Check. If a larger proportion of the male population in each age group is excluded for this reason, it could explain the difference in uptake found.

In England although there are more males than females born, by the age of 40, this has reversed and there are nearly two percent fewer males than females resident in the population. In an attempt to explore whether this might explain the variation that we found in the proportions of women receiving a NHS Health Check compared to men, an odds ratio was calculated. This was based on proportion of males to females receiving a NHS Health Check compared to proportion of males to females in these age groups in the general population. There were two possible sources of data available as the denominator for the population in each age group, the first was the GP registered population and the second was the ONS estimated population. Particularly in the younger age groups eligible for a NHS Health Check (40 – 60 years of age) there was a significant difference between these two estimates, with the GP registered population being significantly higher than the ONS estimated population. For example, in the 40 – 44 year old age band there were 18,003 males and 17,156 females on the GP registers but only 16,168 males and 16,406 females in the ONS estimated population. In this age group alone, there were 1,835 more males on the GP registers than were estimated to be resident. The ratio of males to females was largely as expected in the ONS registered population, but in the GP registered population there were a lot more males than females. The rural economy in parts of Lancashire is known to attract single male workers from Poland and other Eastern European countries, but these are usually younger men (aged 20 to 30 years), who tend to go back home either at the end of the summer season, or after a few years working. Some settle down and stay in the UK, but by the age of 40 this is usually with a partner and a family. Could this relatively high GP registered population in the 40 – 60 age groups be caused by ‘ghost patients’ i.e. single male workers who had registered with a GP several years ago when they were in their twenties or thirties, but who remained on the GP register because their departure from the country had never been recorded? LaSCA (now part of the Primary Care Support Services provided by NHS England) had a responsibility for checking the GP registered population and were approached, but could not provide any explanation for the disparity.

Since it was not possible to determine which denominator (ONS estimate or GP registered) was more reliable, odds ratios were calculated based on both populations, and the results are shown in Figure 2. The two sets of data showed different estimates for the odds ratio, between the ages of 40 to 60 years of age, but were more similar in the older age groups. There was no significant difference between the two sets of data, but whether GP registered or ONS estimated populations were used, both showed that uptake of NHS Health Checks appeared to be between 10 and 27 percent higher in females compared to males. The 95% confidence intervals (Table 2) showed that other than in the 60 – 64 year age group, women were significantly more likely to receive a NHS Health Check than men. Please note that neither set of calculations was based on the ideal denominator which would be the known eligible population, since this was not available broken down by sex.

A recent study conducted by the National Pharmacy Association found that on average women visit their GP six times a year whereas men only visit four times a year (National Pharmacy Association, 2012). The review also found that nearly nine out of ten men do not like to trouble a doctor or a pharmacist unless they have a serious problem and that men are twice as likely as women to have a full-time job and are more than three times more likely to work over 45 hours per week, making getting to a surgery more difficult (National Pharmacy Association, 2012). Government policy is for GPs and primary care to have a greater role in public health and several elements, such as reducing under mortality from cardiovascular disease among those less than 75 years of age appears in both the NHS and the Public Health Outcome Frameworks (Department of Health, 2011). The apparent reluctance of men to take advantage of preventive or wellbeing services could affect a GP's ability to successfully attract men in for a NHS Health Check.

There does appear to be a sex based inequity in uptake of NHS Health Checks. If invitations are commonly offered opportunistically; and we know that women use NHS services more than men, this could have created the observed imbalance. Alternatively it may be that men are invited as frequently as women, but are less likely to take up the offer and come in for a NHS Health Check.

Since women do tend to see their GP more often than men, it may be that those at high risk are being identified at a younger age and excluded from the eligible population. If this were true, it would make the observed inequity between the sexes even worse than indicated by this data.

Map 2 shows numbers attending for a NHS Health Check by Lower layer Super Output Area (LSOA). A Lower layer Super Output Area is a relatively small geographical area with a minimum population of 1000 and a mean of 1500. Electoral wards are made up of a number of LSOAs, but numbers living in a ward are highly variable and boundaries change. LSOAs therefore provide a reasonably consistent geography that can be used to compare one area with another when looking at crude numbers. If there is equitable access to NHS Health Checks, similar numbers attending would be expected in each LSOA. However, Map 2 shows great variation in numbers attending for a NHS Health Check. Low numbers could indicate a lack of provision leading to problems with access or could be caused by poor response to invitations. Problems with provision or access could be linked to GPs who either do not offer the service or only provide opportunistic invitations in a non-systematic manner. More research is needed to understand this variation better.

Figure 3 shows how the proportion of people identified at high risk increased with age. This was as expected, since age of itself increases risk and by the age of 65 most people are receiving treatment for a long term condition that would exclude them from eligibility for a NHS Health Check. Figure 4 shows how the proportion of males identified at high risk increased substantially with age, with 65.4 percent of those in the 70 – 74 year age group identified as high risk. This clearly detects an unmet need in these older men. Figure 5

shows a similar pattern, but even in the oldest age group, the proportion identified at high risk in women is relatively low at 18.7 percent. This variation could reflect the observation that women tend to develop cardiovascular disease at a later age than men, (see) but this is unlikely to explain such a large variation, since the prevalence of many of the factors that might put someone into the high risk category such as hypertension or high cholesterol are similar in both sexes. There are a lot of men who reach the age of 70 with unidentified high risk and the most logical explanation is that risk has not been identified earlier because of men's reluctance to access health services unless they are seriously ill (National Pharmacy Association, 2012). Once the NHS Health Checks programme is fully operational, it would be interesting to review these data again, since men and women with high risk should be identified at an earlier age, and numbers first identified at high risk when they attend for a NHS Health Check in this older age group should become relatively few.

DEPRIVATION

Although data were available that could have provided information about the relative proportion of those who had received a NHS Health Check living in each Index of Multiple Deprivation (IMD) quintile, their presentation would have been meaningless without the facility to compare with data about the eligible population which were not available. However, information about the eligible population's GPs was available. Figure 6 shows the relative proportions of the population eligible for a NHS Health Check based on the IMD of their GP, and Figure 7 shows the relative uptake of NHS Health Checks – again based on the IMD of their GP. By comparing these two charts it is clear that the group that appears most underrepresented is the population in quintile 2 (one of the more deprived quintiles). Although 50 percent of the eligible population's GP is in quintile 1 or 2, only 42 percent of the NHS Health Checks undertaken came from a GP in quintile 1 or 2. Conversely there were 18 percent and 21 percent respectively of the eligible population whose GP was in quintiles 5 and 4, and uptake in these more wealthy areas was 21 and 26 percent respectively. Although these data must be viewed with caution since they are based on the address of the GP rather than the individual, they do seem to indicate that those living in the more wealthy areas have better access to NHS Health Checks than those in the areas of deprivation. There are several possible reasons for this, but essentially either GPs in the more deprived areas are inviting a comparatively lower proportion of their eligible population in, or invitations are not creating a response that ends with a completed NHS Health Check.

Figure 8 further supports this and shows that uptake of NHS Health Checks was average for those individuals whose GP is in quintile 3, and lower among those whose GP was in a more deprived area and higher among those whose GP was in a more affluent area.

Map 3 shows that the proportion of those who received a NHS Health Check in each ward and were determined to be at high risk. If primary care services are working well, then many of those who are at high risk should have been identified, and receiving appropriate treatment and would have been excluded from the population eligible for a NHS Health

Check. So Map 3 does not show where risk of cardiovascular disease is high in the population, but is more an indicator of where current primary care services are not successfully identifying those who are at high risk and this is very variable, but does not appear to be particularly linked to deprivation. For example, area 65 (Salmesbury and Walton) is among the 40 percent most deprived wards nationally and a large proportion of those who attended for a NHS Health Check were found to be at high risk. However Ecclestone and Mawdesley (area 14) is among the most affluent 20 percent of wards nationally and also had a high proportion of those found to be at high risk.

It is interesting to note that the pattern of risk does not appear to vary by IMD and roughly similar proportions of those at high, moderate and low risk were identified in each IMD quintile.

COMMISSIONING OF NHS HEALTH CHECKS POST APRIL 2013

Linked to implementation of the Health and Social Care Act 2012, in April 2013 responsibility for commissioning NHS Health Checks has transferred to the local authority. In Lancashire, this meant that responsibility for commissioning of the NHS Health Checks programmes transferred from three PCTs and became the responsibility of Lancashire County Council.

The legal duty to improve the public's health falls to the local Health and Wellbeing Board, which provides a statutory forum for key leaders from the health and care system to work together to improve the health of the local population. Responsibility does not lie solely with local authorities and Public Health England, NHS England and especially NHS Clinical Commissioning Groups all have a part to play especially when responsibility for outcomes such as reducing cardiovascular mortality are shared (Department of Health, 2011).

The newly developing health systems are built around outcomes frameworks (Department of Health, 2011). The Public Health Outcomes Framework has two overarching outcomes which are;

- Increased healthy life expectancy
- Reduced differences in life expectancy and healthy life expectancy between communities

Both are linked to NHS Health Checks.

Public Health England published priorities for 2013/14 and as part of the commitment to reduce preventable deaths it said that it will "Support people to live healthier lives by implementing NHS Healthchecks to 15 million eligible people. We will support the roll-out of the Healthcheck programme by local authorities, assuring full implementation across the country" (England, 2013)

The local authority has a statutory duty to commission the risk assessment element of the NHS Health Checks, and is also required to commission public health interventions recommended by the National Institute for Health and Care Excellence (NICE) to support people to adopt healthier lifestyles.

However as part of their responsibility, GPs will need to work with local authorities to provide support and services to patients identified as high risk, including additional testing, diagnosis, on-going treatment and referral to secondary care as needed. Funding to cover clinical follow up has been factored into GP budgets provided through NHS England.

Although Clinical Commissioning Groups (CCGs) are not responsible for commissioning the main primary care contracts, they are taking a leadership role in shaping the development of many of the more innovative or additional new preventive services offered through primary care and have a legal duty to support quality improvement in general practice. Since CCGs now carry the responsibility for commissioning secondary care services, it behoves them to take an interest in the interface between primary and secondary care and in ensuring the delivery of effective primary care services that reduce the need for expensive hospital based treatment and care. Provided NHS Health Checks succeed in facilitating a change in behaviour among those identified at high and moderate risk, this will reduce secondary care costs for the treatment of cardiovascular disease and stroke in the future. However, NHS Health Checks will save most money for the NHS by identifying and supporting behaviour change among those with impaired glucose tolerance or in the early stages of diabetes.

One of the key findings from a Kings Fund report into clinical commissioning groups suggested that “CCGs have an important opportunity to support improvement in general practice but will need to strike a careful balance if they are to perform this function without alienating their GP members” (Naylor et al., 2013) NHS Health Checks could provide CCGs with an opportunity to work across organisations and win support of their local clinical community and demonstrate benefits to patients.

Lancashire County Council has an opportunity to work in partnership with CCG, GPs and other organisation and use NHS Health Checks to help address health inequalities. As Marmot said “Local Councils have the power to secure the economic, environmental and social well-being of the local population. They are therefore in a key position to mobilise action to tackle health inequalities and improve well-being.

Action to address health inequalities will mean raising the awareness of the social determinants of health among local government, including elected members. There is a real challenge to increase political and workforce capacity and confidence in addressing the social determinants and a need to disseminate successful initiatives while also understanding the limitations of lifestyle interventions. There is also a need to scale up interventions to achieve better outcomes.

Critical to any success is the issue of collaborative partnership working. Health inequalities cannot be addressed by any single organisation or indeed any one sector. Any approach needs to be forged in strong partnership working across disciplines and sectors. This requires a positive exercise of community leadership alongside commissioning” (M. G. Marmot, 2010).

CONCLUSIONS

There were some clear inequities identified in the provision and delivery of NHS Health Checks commissioned by NHS Central Lancashire in 2011/12.

The first is that there was a significant proportion (more than 10 percent) of the eligible population who simply did not have access to the programme because their GP had not agreed to provide NHS Health Checks and no alternative was provided. There was another group whose GP had agreed to provide NHS Health Checks, but then did not send out invitations systematically and only offered the service opportunistically to those few members of the eligible population who visited the surgery for something else. With the local enhanced service contracts, there were no incentives for achieving the target for numbers invited, nor for converting invitations into completed NHS Health Checks. Neither were there any penalties for failing to reach targets for invitations provided nor for NHS Health Checks completed. It seems inequitable that those GPs who invested in sending out invitations in a systematic manner, would have experienced comparatively greater expenditure compared to those who relied on opportunistic invitations only.

The NHS Health Checks programme was monitored and evaluated nationally and locally according to number of invitations and NHS Health Checks completed. It was not possible to identify any benefits to health, since there was no way of monitoring whether those who were at moderate or high risk were given the appropriate interventions and referral to service and then whether patients subsequently changed their behaviour, so that their individual health improved or cardiovascular risk was reduced.

There were inequities identified in relation to age and sex. However, analysis of the variation in uptake of NHS Health Checks could be influenced by inaccuracies in the denominator data. In the absence of detailed information about the eligible population, we assumed that the distribution of age and sex in the eligible population was similar to that in the GP registered or ONS population, which may not be correct.

Given the limitations of the data, it looks as if men are less likely to attend for a NHS Health Check than women. This is a serious inequity, since proportionately more men than women especially in the older age groups appear to be at higher risk of cardiovascular disease. Clearly action is needed to improve uptake of NHS Health Checks among men of all ages.

One of the original objectives of this study was to explore uptake by Mosaic, but since denominator data for the eligible population were not available by postcode, this was not possible. As with the analysis based on Index of Multiple Deprivation (IMD 2010) this information was available by postcode of the GP only. Since there are more Mosaic categories than quintiles of deprivation, it would have been highly inaccurate to have used Mosaic categories, so this was not attempted.

There is clear inequity in uptake of NHS Health Checks based on deprivation and as with many NHS services, those in the more wealthy areas, who are less likely to have undetected cardiovascular disease or diabetes, were more likely to attend for a NHS Health Check and vice versa. Marmot provides local authorities, who now commission NHS Health Checks, with suggestions to deal with this variation by addressing the social gradient linked to health inequalities (M. G. Marmot, 2010).

The cardiovascular needs assessment for Central Lancashire (2010) identified that CVD risk overall was linked to geography and that those living in areas of high deprivation experienced higher levels of CVD related morbidity and mortality. So it was interesting to note that the risk pattern was variable across geographical areas and similar across all IMD quintiles. Since the denominator for this was based on the postcode of the eligible population's GP, it is possible that it was the relatively wealthy and with the least need in the GP's eligible population who were invited, or who responded to the invitation to come in for a NHS Health Check. Anyone identified as high risk is no longer eligible for a NHS Health Check, so an alternative explanation is that there is great variation in the ability to identify and treat those at high risk through current primary care services and that this is not linked to deprivation.

LIMITATIONS

One of the biggest problems faced when trying to complete this health equity audit, was that even though data about individuals by age and postcode for those who had received a NHS Health Check were available, equivalent details for the eligible population were not. Without an accurate denominator, it is impossible to make the valid comparisons between different group of people about invitations and uptake that are needed.

Although data were available about sex and age, it would have been useful to have had other data that could influence health inequalities such as ethnicity, education and employment status.

RECOMMENDATIONS

1. Since the provision of NHS Health Checks is not included in the national contract, it can only be provided by GPs who agree to accept this additional responsibility and there will always be some GPs who choose not to offer this service. Even if the service continues to be provided primarily by GPs, there must be at least one and possibly more alternate provider commissioned to cover the eligible, currently disenfranchised population whose GP decides not to offer the programme.
2. In addition, the providers of NHS Health Checks need clearer incentives for achieving the various national targets (for invitations and uptake) and the application of penalties or remedial action for failing to achieve targets. These should be negotiated beforehand and included in all contracts.
3. Current NHS Health Check contracts allow considerable flexibility in the way patients are invited in for a NHS Health Check. Although this worked reasonably well when the programme was introduced, and it facilitated the use of opportunistic invitations, it is not sustainable in the longer term and this evaluation suggests it possibly contributed to the gender inequity that was discovered. Whilst it is important to retain the option for opportunistic invitations, the commissioners need to set up, and ensure that the providers use a systematic method for identifying and inviting eligible patients in for a NHS Health Check every five years. (Lessons could possibly be learned from the way major screening programmes systematically invite patients in).
4. A process for partnership working needs to be set up between commissioners and providers (to include GPs, Clinical Commissioning Groups, Public Health England and Lancashire County Council and any other providers) around what each will contribute to reducing inequalities in cardiovascular mortality in those under 75 years of age by supporting the NHS Health Checks programme and creating a seamless service to follow up those identified as moderate or high risk.
5. The NHS Health Checks programme should play a part in reducing health inequalities and achieving the various outcomes frameworks' objectives for reducing mortality in those under 75 years of age, so it is important to set up processes and systems to assess the impact of the NHS Health Checks programme on health outcomes, rather than simply scrutinising the process and numbers going through. (Possible options might include monitoring lifestyle services to find out which patients were referred following a NHS Health Check, and undertaking regular small surveys to explore longer term outcomes following a NHS Health Check).
6. Since striving for equity is to remain a core objective of government policy, the data needed to assess health must be collected routinely, and health equity audit become a standard element in monitoring and evaluation of the NHS Health Checks service. Data

by age, sex, ethnicity, and if possible level of education, employment status and other socioeconomic factors must be available for the eligible population (denominator) as well as those who have been invited and who have received a NHS Health Check (numerator). Comprehensive denominator data is needed to examine equity, as valid comparisons about invitations and uptake cannot be made without it. Relevant, complete data about the population eligible to be invited for a NHS Health Checks therefore need to be obtained (possibly from GP systems) so that accurate comparisons can be made.

7. Future NHS Health Checks services must be commissioned so that the relevant data for monitoring health equity are collected from the start; and so that the data are analysed and used to monitor equity in a transparent and systematic manner. A process for feeding the results from health equity audits into service redesign and quality improvements (for local authority, GPs and CCGs) should be developed.
8. Further work needs to be done to find out what would encourage men to attend for a NHS Health Check. This could possibly include some new small scale research and pilot studies, but should also be informed by the existing body of evidence available from published social marketing and other research. (Several useful research reports are available on these websites; www.nsmcentre.org.uk and www.healthcheck.nhs.uk). The invitation sent to men needs to appeal more clearly to things they value. The use of email, text reminders and social media should be investigated as part of the review of the invitation and reminder systems.
9. Similarly, further work and pilot studies need to be done to find innovative ways to ensure that those living in the more deprived areas are actually invited in and encouraged to attend using appropriate media and language that appeals to them. There are some good suggestion about how to do this in The Marmot Review, Fair Society: Health Lives, full report, Chapter 5 Making it happen: A framework for delivering and monitoring reductions in health inequalities along the social gradient (M. G. Marmot, 2010).
10. Funding to help different groups understand what NHS Health Checks are all about needs to be provided, and appropriate social marketing campaigns undertaken.
11. Although this health equity audit did not find clear evidence that working outside the home is a barrier to accepting the offer of a NHS Health Check, the survey carried out by the National Pharmacy Association suggests that further work or pilot studies to explore alternative settings (such as workplaces) that may make it easier and encourage men (and women) to attend for a NHS Health Check would be helpful (National Pharmacy Association, 2012).
12. If a GP service is retained (and there are very good reasons for keeping a GP based system) it is important that any other providers work in harmony with and complement

the GP based system and preferably link in with it. Eligible patients need to be identified and invited in and results from NHS Health Checks entered onto individual medical records held by the GP.

13. Lancashire County Council should explore ways of linking NHS Health Checks to other services they offer to enhance the effectiveness of both. Some of the suggestions provided by Marmot about how best to deal with the inequities in the social gradient linked to health inequalities would be a good place to start (M. Marmot & Bell, 2010; M. G. Marmot, 2010).
14. Although possibly of less importance to the monitoring and evaluation of NHS Health Checks, it is imperative that the difference between the ONS estimated population and the GP registered population for those in the 40 – 60 year age brackets is explored thoroughly. A significant element of the GP payment is based on a capitation fee, so if these data are incorrect, the NHS will be paying for patients who are not there and the NHS Health Checks programme will appear to be less successful than it really is.

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APPENDIX 1

KEY TO WARD MAPS

Key	Ward name	Key	Ward name
Chorley			
1	Adlington and Anderton	2	Astley and Buckshaw
3	Brindle and Hoghton	4	Chisnall
5	Chorley East	6	Chorley North East
7	Chorley North West	8	Chorley South East
9	Chorley South West	10	Clayton-le-Woods and Whittle-le-Woods
11	Clayton-le-Woods North	12	Clayton-le-Woods West and Cuerden
13	Coppull	14	Eccleston and Mawdesley
15	Euxton North	16	Euxton South
17	Heath Charnock and Rivington	18	Lostock
19	Pennine	20	Wheelton and Withnell
Preston			
21	Ashton	22	Brookfield
23	Cadley	24	College
25	Deepdale	26	Fishwick
27	Garrison	28	Greyfriars
29	Ingol	30	Larches
31	Lea	32	Moor Park
33	Preston Rural East	34	Preston Rural North
35	Ribbleton	36	Riversway
37	St George's	38	St Matthew's
39	Sharoe Green	40	Town Centre
41	Tulketh	42	University
South Ribble			
43	Bamber Bridge East	44	Bamber Bridge North
45	Bamber Bridge West	46	Broad Oak
47	Charnock	48	Coupe Green and Gregson Lane
49	Earnshaw Bridge	50	Farington East
51	Farington West	52	Golden Hill
53	Howick and Priory	54	Kingsfold
55	Leyland Central	56	Leyland St. Ambrose
57	Leyland St. Mary's	58	Little Hoole and Much Hoole
59	Longton and Hutton West	60	Lostock Hall
61	Lowerhouse	62	Middleforth
63	Moss Side	64	New Longton and Hutton East
65	Samlesbury and Walton	66	Seven Stars
67	Tardy Gate	68	Walton-le-Dale
69	Whitefield		
West Lancashire			
70	Ashurst	71	Aughton and Downholland
72	Aughton Park	73	Bickerstaffe
74	Birch Green	75	Burscough East

Key	Ward name	Key	Ward name
76	Burscough West	77	Derby
78	Digmoor	79	Halsall
80	Hesketh-with-Becconsall	81	Knowsley
82	Moorside	83	Newburgh
84	North Meols	85	Parbold
86	Rufford	87	Scarisbrick
88	Scott	89	Skelmersdale North
90	Skelmersdale South	91	Tanhouse
92	Tarleton	93	Up Holland
94	Wrightington		