Better Health campaign

Phase 1: evaluation of the NHS weight loss plan app

Contents

Acknowledgements

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Acknowledgements

Executive summary

Background

In July 2020, PHE launched a new adult health campaign called 'Better Health' to help kick start the nation's health, encouraging healthier diets and physical activity. The campaign focused on supporting weight management and health behaviours amongst people living with overweight and obesity, and in particular men aged 40 years and over, lower socioeconomic groups, Black, Asian and Minority Ethnic groups and those living with long-term health conditions. One of the major driving factors for the campaign was the publication of a report by PHE which showed that people living with overweight or obesity were at an increased risk of serious coronavirus (COVID-19) complications and death, when compared with those of a healthy weight (1).

As part of the 'Better Health' campaign, PHE launched the updated version of the NHS Weight Loss Plan as a mobile app[1]. The 12-week plan was originally available on the NHS website and the guides were broken down into simple weekly food and activity charts to record calories, exercise and fruit and vegetable intake. They also included healthy eating, diet and exercise advice. They were available in PDF format downloadable from the NHS website, or on a mobile phone app. The updated version of the app was developed to create an interactive and easy to use version of the 12-week plan. The new app included:

1. A BMI Calculator at the point of entry where users were able to enter their weight, height, gender and ethnicity so their BMI and weight category could be calculated in order to determine if the app was suitable for them. Those who had a BMI in the healthy weight and underweight categories were then shown messaging explaining that the app was not for them. At the start and end of each week, users self-reported their weight. Body weight and BMI were visually tracked.
2. A daily diary which tracked their food and calorie intake against meals (breakfast, lunch, dinner, snacks and drinks), amount of fruit and vegetables, and minutes of physical activity each day.
3. A daily calorie target of 1,400kcals and 1,900kcals for women and men each day respectively. This was then later updated to become a personalised target based on the height, weight, age and gender data that had been entered by the user.
4. A goal setting function, where users were able to enter their motivations for beginning their weight loss journey when they first began using the app.
5. A variety of magazine style weight management guides in line with current government advice on healthy eating.
6. A range of links to other programmes that support healthy behaviours such as Couch to 5K.

The 12-week plan is free for adults to download from the App store and Google Play.

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[1] In this document the NHS Weight Loss Plan is referred to as 'the 12-week plan'.

Context of this evaluation

PHE commissioned the University of Leeds and The James Hutton Institute to undertake an evaluation of the 12-week plan.

To date, there have been 2 'Better Health' adult obesity campaign advertising bursts (TV and other media advertising) which include a reference to this app (27 July to 9 October 2020 and 4 January to 31 March 2021). A third burst of campaign activity was launched on 26 July 2021 and will run 10 September 2021.

The analysis included in this report contains data collected specifically on app usage, recorded between 27 July 2020 and 9 February 2021. Recommendations have also been included in this report for future iterations of the product. Analysis of data captured after the 9 February will be conducted as part of the next phase of the evaluation.

Aim

The primary aim of this evaluation was to examine the impact of the 12-week plan app on weight, fruit and vegetable intake and minutes of physical activity.

Methods

The information entered by the 12-week plan users (weight, height, age, gender, ethnic group, weekly start and end weights, calories consumed, fruit and vegetable portions, minutes of physical activity) was recorded in a Google Big query database alongside the day and time of each session and screen viewed by the user. Data was extracted from the database on 6 May 2021, and all users who started on or before 9 Feb 2021 were included in this evaluation. There were 864,403 app downloads, and after data cleaning (data cleaning protocol provided in Appendix 2) 863,592 remained.

A statistical analysis of the observational data was conducted to assess the significance of the associations between app use measures, weight outcomes and health behaviours.

Main findings

As of 9 February 2021, the 12-week plan had been downloaded 864,403 times. Of these downloads, 726,126 users inputted their details into the BMI calculator, 68,942 started to use the 12 week plan and 8,305 went on to complete the 12 weeks. Of downloads, 81.5% were female and 18.5% were male, 54.2% were aged 40 years or over, 88.2% had a BMI of 25 kg/m^2 or above and 71.2% were White. For most ethnic groups, downloads reflected the national ethnic breakdown.

All users who started the 12-week plan (which includes those who completed it) reported a statistically significant mean reduction in weight of 2.4% (CI[2] 2.3, 2.4) of their starting body weight (an average of 2.1kg (CI 2.1, 2.1)), with 17.1% of starters reporting a clinically significant reduction in weight (5% or more of their body weight).

Of those who completed the 12-week plan 94% reported some weight loss, with a statistically significant average reduction of 6.5% (CI 6.4, 6.6) of their starting body weight (an average of 5.8kg (CI 5.7, 5.9). Nearly two-thirds (64.2%) of these users reported a clinically significant reduction in weight (5% or more of their body weight).

Differences in weight loss were also evident based on gender, where males who completed the 12-week plan lost significantly more weight (6.9% (CI 6.7, 7.1)) compared to females (6.4% (CI 6.3, 6.5)).

Average weight loss of users who completed the 12-week plan aged 30 to 39 years was 7.3% (CI 7.1, 7.6) of their body weight, whilst 40 to 49 year olds lost 6.9% (CI 6.7, 7.1) and 50 to 59 year olds lost 6.3% (CI 6.2, 6.5).

On average, users who completed the 12-week plan with a BMI between 30 to 34.9 kg/m^2 lost the most weight, although all BMI categories above 25 kg/m^2 lost similar amounts (6.4 (CI 6.3, 6.6) to 6.8% (CI 6.6, 7.0)).

Users who completed the 12-week plan of all ethnicity groups, reported a reduction in weight with the most weight loss reported by Black African (6.72% (CI 5.60, 7.95)) and White (6.54% (CI 6.43, 6.64)) users.

Approximately a third of users reported increased fruit and vegetable consumption and an increased amount (minutes) of physical activity (36% and 34% respectively) over the 12 weeks.

Amongst starters, there was a significant (p less than 0.001) association between days using the 12-week plan and weight change; where those who used the 12-week plan on more days reported greater weight loss. However, amongst completers, there was no clear association between the number of days using the 12-week plan and weight change.

67% of completers continued to use the 12-week plan past 12 weeks.

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[2] CI = Confidence Interval (calculated at 95%).

Discussion

The NHS Weight Loss Plan app has the potential to reach a large number of UK adults, with findings suggesting that this free to use mobile app could have a beneficial impact on population health.

However, there was a large drop off between those downloading and starting the 12-week plan, and between those who started and those who completed the plan. This highlights a need to understand the barriers to starting, and the high attrition rates once using it. A high proportion of the users were female which is typically in line with what other weight management products and providers report (2). The majority of downloads were adults aged 40 years and above and those who had a BMI of 25kg/m^2 and above. This is reflective of the target audience for the 'Better Health' campaign. Downloads for most ethnic groups was in line with national averages, which again may be reflective of the media targeting.

Most users reported weight loss, with nearly 1 in 5 starters (17.1%) and nearly two-thirds (64.2%) of completers reporting clinically significant weight loss in line with NICE recommendations for weight management programmes. Males lost more weight than females, which is in line with what is reported from other weight management programmes. Of those who completed the plan, users aged 30 to 39 years and those with a BMI of 30 to 34.9 kg/m^2 lost the greatest amount of weight. Weight loss was similar across all age groups, BMI categories and ethnic groups indicating that the app is similarly beneficial for all groups.

This early evaluation suggests that the degree of weight loss is relatively high compared with weight loss outcomes reported elsewhere. This may, however, only reflect the motivation of the groups who completed the programme. Given that most user did not complete the 12 weeks, further evaluations will be needed as the number of users increase and improvements to the app are made.

1. Background

In July 2020, PHE launched a major new adult health campaign called 'Better Health' to seize the opportunity for a national reset moment as part of the updated national obesity strategy. One of the major driving factors for the campaign was the publication of a report by Public Health England (PHE) which showed that people with COVID-19 who were living with overweight or obesity, were at an increased risk of serious COVID-19 complications and death, when compared with those of a healthy weight (1).

COVID-19 has affected the whole country; for almost everyone, life has had to fundamentally change. 'Better Health' used this unique moment in time to help kick start the nation's health, by encouraging healthier diets and physical activity. The campaign focused on supporting weight management and health behaviours amongst people living with overweight and obesity, and in particular men aged 40 years and over, lower socioeconomic groups, Black, Asian and Minority Ethnic groups and those living with long-term health conditions.

As part of the 'Better Health' campaign, PHE launched the updated version of the NHS Weight Loss Plan as a mobile app[3]. The 12-week plan was originally available on the NHS website and the guides were broken down into simple weekly food and activity charts to record calories, exercise and fruit and vegetable intake. They also included healthy eating, diet and exercise advice. They were available in PDF format downloadable from the NHS website, or on a mobile phone app. The updated version of the app was developed to create an interactive and easy to use version of the 12-week plan.

The new app included:

1. A BMI Calculator at the point of entry where users were able to enter their weight, height, gender and ethnicity so their BMI and weight category could be calculated in order to determine if the app was suitable for them. Those who had a BMI in the healthy weight and underweight categories were then shown messaging explaining that the app was not for them. At the start and end of each week, users self-reported their weight. Body weight and BMI were visually tracked.
2. A daily diary which tracked their food and calorie intake against meals (breakfast, lunch, dinner, snacks and drinks), amount of fruit and vegetables, and minutes of physical activity each day.
3. A daily calorie target of 1,400kcals and 1,900kcals for women and men each day respectively. This was then later updated to become a personalised target based on the height, weight, age and gender data that had been entered by the user.
4. A goal setting function, where users were able to enter their motivations for beginning their weight loss journey when they first began using the app.

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[3] In this document the NHS Weight Loss Plan is referred to as 'the 12-week plan'.

5. A variety of magazine style weight management guides in line with current government advice on healthy eating.
6. A range of links to other programmes that support healthy behaviours such as Couch to 5K.

To date, there have been 2 'Better Health' adult obesity campaign advertising bursts (TV and other media advertising) which include a reference to this app (27 July to 9 October 2020 and 4 January to 31 March 2021). Data was, and continues to be, collected and managed by PHE. The 12-week plan is frequently updated based on user insights and testing in line with Government Digital Service (GDS) standards and as part of the wider 'Better Health' campaign evaluation (see Appendix 1 for user testing research).

The analysis included in this report contains all data recorded between 27 July 2020 and 9 February 2021.

The research team from the University of Leeds and the James Hutton Institute were commissioned to lead the evaluation of the 12-week plan.

2. Aims

The aim of this evaluation was to examine the impact of the 12-week plan app to support weight management and health behaviours. The objective of the evaluation was to explore the uptake, and impact of the 12-week plan to support weight management based on user gender, age, body mass index (BMI), and ethnic group.

3. Research questions

1. What is the uptake and impact of the 12-week plan in supporting weight management and positive behaviour change?
2. Does the uptake and impact of the 12-week plan differ by socio-demographics and weight status?

4. Methods

The information entered by the 12-week plan users (height, weight, age, gender, ethnic group, weekly start and end weights, calories, exercise minutes, fruit and vegetable portions) was recorded in a Google Big query database alongside the day and time of every session, and screen viewed by the user (see Appendix 2 for detailed information on data collected from user). Data was extracted from the database on 6 May 2021, and all users who started on or before 9 Feb 2021 were included. There was 864,403 app downloads, and after data cleaning (data cleaning protocol provided in Appendix 3) 863,592 remained.

In line with the PHE 'Standard Evaluation Framework' for Weight Management Interventions' (4), users were classified into 2 groups and compared based on their weight outcomes:

1. Starters: users who recorded at least a start and end weight in week 1. This included completers.
2. Completers: users who recorded a start and end weight in week 1 and week 12, as well as their weight at the end of at least 9 (75%) of the 12 weeks.

Statistical analyses

As groups (gender, age, BMI, ethnic group) were unbalanced, the mean weights for these groups were obtained as estimated marginal means following analysis of variance with terms for gender, age group, BMI category and ethnic group. Statistical significance was also determined from an F-test based on these ANOVAs. A similar analysis was done to assess the significance of association between app use measures and weight outcomes, though standard means rather than marginal means were reported because of the close association between different use measures. Confidence intervals were calculated from the estimated standard error.

5. Findings

User characteristics

Between 27 July 2020 and 9 February 2021, the 12-week plan was downloaded 864,403 times, with 68,942 users starting to use the 12-week plan, and 8,305 users completing the 12-week plan. A high proportion of users were female compared to male, with good uptake across the age groups. 54.2% of downloads and 75.4% of those who completed the plan were aged 40 years or over and 88.2% had a BMI of 25 kg/m^2 or above. In terms of ethnicity, most users were white (71.2% of downloads and 91.7% of completers). For most ethnic groups, the uptake reflected the national ethnic breakdown. Table 1 provides a breakdown of the demographic characteristics of app users.

Table 1. Demographic characteristics of app users
Note: 'not stated' indicates that users did not select an option in the 12-week plan.

Category	Demographic	App downloads number (%)	Starters number (%)	Completers number (%)
	N	864,403 (100)	68,942 (100)	8,305 (100)
Gender	Female	592,049 (81.5)	57,627 (83.6)	6,322 (76.1)
	Male	134,158 (18.5)	11,315 (16.4)	1,983 (23.9)

Category	Demographic	App downloads number (%)	Starters number (%)	Completers number (%)
	Not stated	138,196	0	0
Age	18 to 29	188,744 (26.0)	13,624 (19.8)	988 (11.9)
	30 to 39	143,868 (19.8)	12,676 (18.4)	1,056 (12.7)
	40 to 49	140,507 (19.3)	13,905 (20.2)	1,505 (18.1)
	50 to 59	153,929 (21.2)	17,325 (25.1)	2,450 (29.5)
	60 and over	99,129 (13.7)	11,412 (16.6)	2,306 (27.8)
	Not stated	138,196	0	0
BMI	Under 25	85,546 (11.8)	4,637 (6.7)	475 (5.7)
	25 to 29.9	240,927 (33.2)	26,220 (38.0)	3,506 (42.2)
	30 to 34.9	194,671 (26.8)	19,708 (28.6)	2,386 (28.7)
	35 to 39.9	113,446 (15.6)	10,437 (15.1)	1,185 (14.3)
	40 to 100	91,536 (12.6)	7,935 (11.5)	752 (9.1)
	Not stated	138,277	5	1
Ethnicity	Bangladeshi	2,790 (0.4)	197 (0.4)	17 (0.2)
	Black African	7,905 (1.1)	514 (0.9)	54 (0.8)
	Black Caribbean	5,566 (0.8)	468 (0.8)	68 (1.0)
	Chinese	1,106 (0.2)	90 (0.2)	15 (0.2)
	Indian	16,126 (2.3)	1,076 (1.9)	142 (2.1)
	Middle Eastern	2,749 (0.4)	164 (0.3)	18 (0.3)
	Mixed	9,766 (1.4)	916 (1.6)	94 (1.4)
	Pakistani	10,452 (1.5)	604 (1.1)	59 (0.9)
	White	510,161 (71.2)	51,584 (91.9)	6,287 (91.7)
	Other	8,087 (1.1)	517 (0.9)	55 (0.8)
	Not stated	151,499	12,812	1,496

Weight change

Overall, there was a reduction in weight and percentage weight change. 77.4% of starters and 94% of completers reported a reduction in weight whilst using the 12-week plan. On average, starters reported 2.4% (2.1kg) and completers reported 6.5% (5.8kg) reduction in weight compared to their starting body weight. 17.1% of starters and 64.2% of completers reported weight loss of 5% or more. 13.2% of starters and 4.4% of completers reported weight gain, which was an average of 2.2% (1.9kg) and 2.9% (2.5kg) respectively. Average self-reported percentage weight change for starters and completers is shown in Table 2, all of which represent a significant weight reduction (average self-reported weight change for starters and completers in kg can be found in Appendix 4).

Table 2. Mean percentage weight change (with 95% Confidence Intervals (CI) for starters and completers overall and by gender, age, BMI and ethnicity)

Category	Demographic	Starters		Completers
		Mean change in weight % (CI) [Last Observation Carried Forward]	Mean change in weight % (CI) [Baseline Observation Carried Forward]	Mean change in weight % (CI)
	Overall	-2.35 (-2.38, -2.33)	-0.79 (-0.81, -0.77)	-6.49 (-6.58, -6.4)
Gender	Female	-2.21 (-2.24, -2.18)	-0.71 (-0.73, -0.69)	-6.35 (-6.46, -6.25)
	Male	-3.1 (-3.17, -3.04)	-1.2 (-1.25, -1.15)	-6.92 (-7.11, -6.74)
Age	18 to 29	-2.16 (-2.22, -2.1)	-0.53 (-0.57, -0.48)	-7.04 (-7.3, -6.77)
	30 to 39	-2.35 (-2.41, -2.29)	-0.63 (-0.68, -0.59)	-7.34 (-7.6, -7.09)
	40 to 49	-2.38 (-2.44, -2.32)	-0.75 (-0.8, -0.71)	-6.86 (-7.07, -6.65)
	50 to 59	-2.4 (-2.45, -2.34)	-0.91 (-0.94, -0.87)	-6.34 (-6.51, -6.17)
	60 and over	-2.5 (-2.56, -2.43)	-1.15 (-1.2, -1.1)	-5.77 (-5.95, -5.6)
BMI	Under 25	-1.82 (-1.93, -1.72)	-0.62 (-0.69, -0.54)	-5.13 (-5.52, -4.75)
	25 to 29.9	-2.41 (-2.46, -2.37)	-0.85 (-0.88, -0.82)	-6.41 (-6.55, -6.27)
	30 to 34.9	-2.43 (-2.47, -2.38)	-0.8 (-0.84, -0.76)	-6.79 (-6.96, -6.62)
	35 to 39.9	-2.33 (-2.4, -2.26)	-0.79 (-0.84, -0.74)	-6.7 (-6.94, -6.45)
	40 to 100	-2.32 (-2.4, -2.24)	-0.68 (-0.73, -0.62)	-6.43 (-6.74, -6.13)

Category	Demographic	Starters		Completers
		Mean change in weight % (CI) [Last Observation Carried Forward]	Mean change in weight % (CI) [Baseline Observation Carried Forward]	Mean change in weight % (CI)
	Not stated	-6.4 (-11.23, -1.56)	-0.1 (-2.62, 2.42)	
Ethnicity	Bangladeshi	-1.95 (-2.44, -1.46)	-0.6 (-0.96, -0.24)	-4.63 (-6.68, -2.59)
	Black African	-2.48 (-2.79, -2.18)	-0.83 (-1.05, -0.61)	-6.72 (-7.85, -5.6)
	Black Caribbean	-2.06 (-2.38, -1.74)	-0.72 (-0.95, -0.48)	-4.58 (-5.58, -3.58)
	Chinese	-2.62 (-3.37, -1.88)	-1.25 (-1.8, -0.71)	-5.24 (-7.35, -3.12)
	Indian	-2.2 (-2.41, -1.99)	-0.8 (-0.95, -0.64)	-5.59 (-6.29, -4.89)
	Middle Eastern	-2.61 (-3.15, -2.06)	-0.78 (-1.17, -0.38)	-6.36 (-8.28, -4.43)
	Mixed	-2.33 (-2.56, -2.1)	-0.85 (-1.02, -0.68)	-5.9 (-6.75, -5.05)
	Pakistani	-2.23 (-2.51, -1.95)	-0.72 (-0.92, -0.51)	-5.54 (-6.62, -4.45)
	White	-2.37 (-2.4, -2.34)	-0.79 (-0.82, -0.77)	-6.54 (-6.64, -6.43)
	Other	-2.19 (-2.49, -1.89)	-0.69 (-0.91, -0.47)	-5.85 (-6.98, -4.73)
	Not stated	-2.34 (-2.4, -2.27)	-0.79 (-0.83, -0.74)	-6.58 (-6.79, -6.37)

Notes

Explanations of 'Last Observation Carried Forward' and 'Baseline Observation Carried Forward' are given in Appendix 3.

'Not stated' indicates that users did not select an option in the 12-week plan.

Weight changes in starters and completers represent a significant reduction in weight in all sociodemographic breakdowns.

Sociodemographic data and weight change

Table 2 shows that overall, both males and females who started and completed the 12-week plan reported a significant reduction in weight. Males who started the 12-week plan lost 3.1% (CI 3.0, 3.2) of their starting body weight and females lost 2.2% (CI 2.2, 2.2). Males who completed the 12-week plan lost 6.9% (CI 6.7, 7.1) of their starting body weight, whilst females lost 6.4% (CI 6.3, 6.5). Males who started and completed the 12-week plan lost significantly more weight compared to females (p less than 0.001).

App users of all age groups who started and completed the 12-week plan, reported a reduction in weight. There was a significant difference (p less than 0.001) in percentage weight change between age groups. Amongst starters, users aged 60 years and over reported the greatest percentage weight loss of 2.5% (CI 2.4, 2.6). Amongst completers, users aged 30 to 39 years reported the greatest percentage weight loss of 7.3% (CI 7.1, 7.6).

App users of all ethnic groups who started and completed the 12-week plan reported a reduction in weight. Amongst starters, users of Chinese and Middle Eastern ethnicity reported the greatest percentage weight loss of 2.6% (CI 1.9, 3.4) and 2.6% (CI 2.1, 3.2) respectively. Amongst completers, users of Black African and White ethnicity reported the greatest percentage weight loss of 6.7% (CI 5.6, 7.9) and 6.5% (CI 6.4, 6.6) respectively. The difference in percentage weight change between ethnicity groups was significant for completers (p less than 0.001) but not for starters.

App users of all BMI groups who started and completed the 12-week plan reported a reduction in weight. Amongst starters, users with a starting BMI of 30 to 34.9kg/m^2 reported the greatest percentage weight loss of 2.4% (CI 2.4, 2.5). Amongst completers, users with a starting BMI of 30 to 34.9kg/m^2 reported the greatest percentage weight loss of 6.8% (CI 5.6, 7.9). This difference was significant (p less than 0.001).

Self-reported health behaviours

Data from app users who reported their daily calorie intake, fruit and vegetable consumption and physical activity demonstrated that:

The average daily calorie intake of starters was 1,461kcal for women and 1,780kcal for men (Table 3).

The average daily calorie intake of completers was 1,461kcal for women and 1,781kcal for men (Table 3).

Amongst users who reported their fruit and vegetable consumption on multiple days, 31% of starters and 36% of completers reported an increase in daily fruit and vegetable

consumption compared to their first entry. 56% and 48% respectively reported a decrease. Those who increased their fruit and vegetable consumption increased from around 2 portions to 3 portions per day.

28% of starters and 34% of completers reported an increase in their daily amount (mins) of physical activity compared to their first entry. 57% and 51% respectively reported a decrease. Those who increased their physical activity increased from around 30 to 55 minutes per day.

Note

Daily calorie intake, fruit and vegetable consumption and minutes of physical activity were collected once users were using the 12-week plan, and therefore change is only comparable to week 1 entry, and not to pre-app use. The changes in averages for those who increased their fruit and vegetable consumption and physical activity levels may be random fluctuation rather than an app effect since the averages were calculated on a subset of users.

Table 3. Mean daily calorie intake recorded by starters and completers

Gender	Starters (kcal)	Completers (kcal)
Female	1,461	1,461
Male	1,780	1,781

App content

Data captured on the use of the 12-week plan content showed that:

- amongst starters, there was a significant (p less than 0.001) association between days using the 12-week plan and weight change; where those who used the 12-week plan on more days reported greater weight loss
- amongst completers, there was no clear association between the number of days using the 12-week plan and weight change
- there was a significant association (p less than 0.01) between the amount of days that users reported calories and weight change; where more days reporting calories was associated with slightly less weight loss
- more days reporting minutes of physical activity was not associated with weight change

6. Discussion and recommendations

The aim of this evaluation was to examine the impact of the 12-week plan to support weight management and health behaviours.

App uptake and adherence

This evaluation suggests a high appeal of the 12-week plan, with over 800k downloads recorded between July 2020 and February 2021. However, despite the high downloads, the number of people who started to use the 12-week plan, and go onto complete the 12-week plan was low, demonstrating a high dropout rate (92% download to starter, 88% starter to completer). Dropout rates were similar across all ethnic groups as seen in Appendix 5. High dropout rates are also reported by weight management services and other mobile phone applications designed to support weight management (5).

It is recommended that improving retention rates remains a focus. This may include the use of appropriate or personalised approaches and behavioural nudges. Further research with minority ethnic groups is also required to ensure content is culturally appropriate to continue to improve uptake rates.

There was a high proportion of females downloading and using the 12-week plan compared to males, which is typically reported in the use of weight management products and services (2). Research also indicates that weight management and motivators to engage in services or use of products differs based on gender (6).

The majority of app downloads and usage was seen in adults aged 40 years and over. This is likely to be reflective of the media targeting, as this was the target age group for the 'Better Health' adult obesity campaign.

The highest proportion of downloaders and users were in the overweight (BMI 25 to 29.9kg/m^2) and obesity (BMI 30 to 34.9kg/m^2) categories, which again was in line with the 'Better Health' campaign target audience for the 12-week plan. There was however a number of users who had a BMI less than 25kg/m^2 (11.8% downloaders, 6.7% starters and 5.7% completers). Exploring the BMI data for these users identified that most had a BMI towards the higher end of the range (that is, 23 to 24.9kg/m^2), which for some minority ethnic groups represents an increased risk. 0.7% of downloaders and 0.1% of completers had a BMI under 20 kg/m^2. The 12-week plan currently discourages use in those who are underweight or at the lower end of the healthy weight range by asking users to enter their height and weight as part of the onboarding process, and if they are a healthy weight or underweight, messaging is shown that explains that the 12-week plan is not for them. The 12-week plan also links out to Beat Eating Disorders to help direct those who may have, or are caring for someone with, disordered eating.

Further consideration as to how to continue to discourage people from using the 12-week plan who do not live with overweight and obesity are recommended, and where appropriate, to signpost people who download the 12-week plan to more suitable resources.

The ethnic breakdown of app users, is broadly representative of the UK population (7) which may be reflective of the media targeting for the 'Better Health' campaign. However, there is under-representation for certain ethnic groups such as Chinese and Black African.

It is recommended that the 12-week plan development team continue to work with different ethnic groups to improve the 12-week plan appeal and to ensure content is culturally relevant.

The evaluation has identified that some completers have continued using the 12-week plan beyond 12 weeks. Research examining the effectiveness of mobile phone applications on weight management have collected data over a longer period of time (for example, over 6 months, some up to 24 months). Mixed effectiveness has been reported, but apps having more features and longer durations can lead to higher rates of clinically significant weight loss (8).

It is recommended that use of the 12-week plan beyond 12 weeks is evaluated. As obesity is a chronic relapsing condition that requires long term support it is essential to ascertain if this app can contribute to longer term weight management and sustained weight loss. This longer term, sustained weight loss is key with ample previous research reporting that people may regain weight lost by weight management behaviours, attendance of service or use of products, and in some instances may gain more weight compared to their starting weight (9).

App impact

This early evaluation has identified that on average, adults who use the 12-week plan report a reduction in weight compared to their starting weight. Users who completed the 12 weeks, reported an average reduction in weight 6.5% of their starting body weight, which is considered a clinically significant reduction in line with NICE guidelines (10). Nearly 1 in 5 starters, and two-thirds of completers, reported a clinically significant reduction in weight. This reduction in weight is greater than what would be expected from a mobile app, with outcomes also beyond the weight loss typically reported by weight management services (11). This reduction in weight may therefore indicate that the 12-week plan could be being used alongside other weight management support interventions.

It is therefore recommended that information on whether users have used or are using other weight management services is gathered in future.

On average both males and females who completed the 12-week plan reported a reduction in their weight over the 12 weeks. There was a difference in weight change, where males on average reported greater weight reduction compared to females in both the starters and the completers. That being said, just over 75% of completers were female, and therefore the

uneven groups may have impacted the group comparison, although this is widely reported in other weight loss studies (12).

Completers aged 30 to 39 years lost the highest amounts of body weight, however, average weight reduction for all age groups between 18 to 59 years was similar. Completers over the age of 60 years also reported a reduction in weight that, whilst lower than the younger age groups, was still on average a clinically significant reduction (that is, 5% or more). This suggests that the 12-week plan is beneficial for all users irrespective of age.

Although users of all ages appear to be benefitting from the app, it is still recommended that a digital inequality impact assessment is undertaken. This will ensure that the app is and continues to be suitable for all age groups, in order to minimise the potential impacts of digital inequalities.

Completers with a BMI between 30 to 34.9kg/m^2 lost the most weight, although all BMI categories above 25kg/m^2 lost similar amounts (6.4 (CI 6.3, 6.5) to 6.8% (CI 6.6, 7.0)). The 12-week plan is therefore demonstrating benefit across for all users above a healthy weight.

On average, completers of all ethnicity groups, reported a reduction in weight with the most weight loss reported by Black African and White users. Whilst the 12-week plan appears to have a beneficial impact on weight management for all users based on ethnic group, the uneven and in some cases, small numbers of users from some ethnic groups suggests a need for more work to further understand potential impact across different ethnic groups. As the amount of app users continues to grow, with more users in each ethnicity group, this finding will need to be verified.

Whilst most app users reported weight loss, there were 13.2% of starters and 4.4% of completers who reported weight gain. Previous research exploring the impact of weight management services and interventions have reported weight gain amongst some users (9). Nevertheless, as this is not the aim of the 12-week plan, it is important to explore why weight gain may have been recorded, and where relevant, to identify mechanisms that can prevent any weight gain.

This evaluation found that more days reporting calories was significantly associated with slightly less weight loss, and that some users stopped reporting calories whilst using other functions of the 12-week plan.

It is therefore recommended that the impact of calorie counting is further explored, and an alternative option to calorie counting in the next app update is investigated.

The results in this evaluation compare with previous research on weight management and digital services. Schippers and others (13) conducted a meta-analysis of mobile phone apps for weight management, and reported modest reductions in body weight when combined with other

delivery modes, which were more in line with the weight loss recorded for starters in the 12-week plan. Outcomes from using mobile phone applications are also expected to be lower than that of face-to-face services. For instance, a Cochrane review of interactive computer-based interventions for weight management and maintenance for people living with overweight and obesity concluded that whist computer-based interventions appear to be effective in supporting people living with overweight or obesity, compared to face-to-face services, they resulted in smaller weight losses and lower levels of weight maintenance (14). Jolly and Colleagues examined the effectiveness of face-to-face weight management services, reporting that average weight loss of commercial weight management services such as Slimming World, Weight Watchers and Rosemary Conley was between 3.76 and 4.71% (11).

Limitations

In conducting this evaluation, there are several limitations of the 12-week plan and evaluation design that should be considered:

1. App users were not asked to record if they were engaged in other weight management actions. It is therefore not possible to conclude whether the 12-week plan is effective in supporting weight loss.
2. There was a high attrition rate from download to starting the 12-week plan, and from starting the 12-week plan to completing the 12-week plan (see Appendix 5). The potential impact of the 12-week plan may only reflect some users, but not those who stopped using it.
3. Most users were female (76.1% amongst completers) and White ethnicity (91.7% amongst completers). Therefore, the overall results may best reflect White females.
4. No data was collected to allow for an evaluation of the 12-week plan based on socioeconomic status (SES). As with new technological solutions, consideration of whether the 12-week plan is used by, and effective for, people of all levels of deprivation is needed. With health inequalities widening, and the association between prevalence of overweight and obesity with greater levels of deprivation (9), it is paramount that SES is examined as part of future evaluations of the 12-week plan.
5. Like many other digital weight management tools, the 12-week plan is based on self-reported weight and health behaviours, which increases the possibility of inaccurate reporting due to biases. Research has identified that self-reported weight may be overestimated by people with a lower BMI (typically less than 22kg/m^2) and underestimated by people with a higher BMI (more than 28kg/m^2) (15). Discrepancies in self-reported weight may also vary with age, gender and ethnic background.
6. Baseline health behaviour data was not collected and as such, it is not possible to evaluate whether the 12-week plan has led to a change in calorie intake, fruit and vegetable consumption or the amount of minutes of physical activity users engaged in.
7. It was identified that people with a BMI of less than 25kg/m^2 were using the 12-week plan and that completers with a BMI in this range reported 5.1% weight loss. The 12-week plan was designed for use by people living with overweight or obesity, and not for people with a lower weight status.

8. Compared to mobile applications for weight management, the 12-week plan only records users' weight, calorie intake, fruit and vegetables consumption, and amount of physical activity. Other mobile applications collect much more data about health and wellbeing including engagement with coaches or healthcare professionals, as well as objectively tracking physical activity, and food and drink consumption.

9. The 12-week plan was launched and has collected data during the COVID-19 pandemic. The COVID-19 pandemic has had a major impact on the way people live, which for some is likely to impact their health outcomes and health behaviours (16, 17). As the data was collected during this time, this is a unique sample of users. Therefore, the behaviours evaluated may not reflect general behaviours seen outside of the pandemic.

10. This evaluation examined the impact of the 12-week plan using observational data and as such, there should be caution in making any inferences about its effectiveness in the absence of a randomised controlled trial.

7. Next steps

The 12-week plan is live and as such there are ongoing updates. The next 'Better Health' campaign burst launched in July 2021. As part of the ongoing updates of the app, several changes in line with this evaluation are recommended for the 12-week plan:

1. Data will be collected about other weight management activities users may be engaged in.
2. PHE app team will explore how to collect data on SES.
3. Data to understand the reasons that people download, dropout and complete the 12-week plan will be collected.
4. In the next iteration, the 12-week plan will provide users with an option of whether they wish to report calorie intake or not.
5. PHE will continue to liaise and work with organisations and charities supporting people living with obesity and from ethnic minority groups. Better understanding of the use of the 12-week plan, and evolving its features to ensure that it is fit for purpose for these groups and meets all user needs will remain a priority.

8. Summary

The app has the potential the potential to reach a large number of UK adults, with findings suggesting that this free to use mobile app could have a beneficial impact on population health. Most users reported a reduction in weight with clinically significant weight loss for nearly 1 in 5 starters and two-thirds of completers. This indicates that the app can support weight management and positive behaviour change. Average weight change for all sociodemographic groups showed a reduction in weight showing the plan is similarly beneficial for all groups. In terms of uptake, there were however high dropout rates, showing the need for continued work to encourage users to both start and stick with the plan.

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10. Appendices

Appendix 1: User insights and app research

User research

User research helps the app development team learn about users and create a service that meet their needs. It ensures that services and products created work well for the users and that any problems they encounter are addressed within product development and improvement stages.

In line with the Government Digital Service (GDS) standards, research is continually conducted with the target audience.

To ensure continual improvement, the development team must be able to quickly:

- update their understanding of users and their needs
- test new design ideas, content and features to see if they work well for all users
- understand problems users encounter and determine resolutions for these

This means undertaking small batches of user research in every iteration of each development phase. This starts with a discovery phase prior to development and continues after the app has been published. This enables continual improvement of the app and is more effective and efficient than larger scale research at the beginning or end of development.

In the most recent user research, 3 key areas were identified for improvement:

1. Calorie counting was highlighted as difficult for users. It was cumbersome and users were taken outside of the app to look up information on the calories that were in the foods and drinks that they were having.
2. The 12-week duration of the plan was not meaningful for users. They either stopped using the app earlier than this or intended to continue to use it beyond the 12 weeks
3. App users were less engaged with content that required them to leave the app to access. This highlighted the need to make sure that all relevant content was contained in the app and not held externally.

These core areas have been addressed in the latest release of the app:

1. Inclusion of a 'non-calorie' mode which allows users to keep a food diary while not needing to enter any numbers for calories
2. Users can now progress beyond the 12 weeks and continue using the app for as long as they wish

3. The number of instances where the user needs to leave the app to find information have been decreased. For example, a built-in calorie lookup function has been included instead of taking the user to the NHS website to do this.

As per the GDS standards, user research will continue on the latest iteration of the 12-week weight loss plan in order to determine the next features for the future app updates.

Appendix 2: Data collected from app users and dietary recommendations given

The data that was collected in the app was self reported by users. They were asked to complete the BMI calculator during the onboarding process which gave tailored content based on the responses. Users were then asked to complete weekly weight values and calculate their daily calorie consumption from the foods and drinks that they consumed. Additional questions within the daily diary were asked about fruit and vegetable consumption, and physical activity.

BMI calculator

Height (drop down list provided in either centimetres or feet and inches).
Weight (drop down list provided in either kilograms or stone and pounds).
Age (numerical free text).
Sex (tick box to select female or male).
Ethnic group was optional (drop down list including the following ethnicities; White, Black Caribbean, Black African, Indian, Pakistani, Bangladeshi, Chinese, Middle Eastern, Mixed, Other).
Activity (tick box to select inactive, moderately active or active).

Weekly diary

Start weight (drop down list provided in either kg or stone and pounds).
Start waist (drop down list provided in either cm or feet and inches).
End weight (drop down list provided in either kg or stone and pounds).
End waist (drop down list provided in either cm or feet and inches).
Daily diary (see below).

Daily diary

Calories (numerical free text for total daily kcals to be entered).
Fruit and vegetables (tick list of 5 options, for users to mark how many of their 5 portions a day they have had).
Activity (free text to enter type of activity undertaken and separate box with numerical free text for the users to input their minutes of physical activity).

On 31 August 2020 the app was updated to improve the recording of calories. Calories were split into the following sections rather than having one daily total:

Breakfast (numerical free text for total daily kcals to be entered)
Lunch (numerical free text for total daily kcals to be entered)
Dinner (numerical free text for total daily kcals to be entered)
Snacks (numerical free text for total daily kcals to be entered)
Drinks (numerical free text for total daily kcals to be entered)

Behavioural and health interventions in app

Weight loss target

Users that had a BMI of 25 and above were given a suggested weight loss goal of 5% of their body weight over the 12-week plan. The information provided also suggested that safe and sustainable weight loss across this timeframe would be 1 to 4lb (1 to 2kg) per week. Users from Black, Asian and minority ethnic groups who had a BMI of 23 and above were also given these weight loss recommendations, as NICE guidance recommends a lower BMI in these groups in order to reduce risk to health.

Calorie target

At the launch of the campaign the daily calorie targets suggested to users were as follow:

Women
(based on an average of 1,400kcals a day)
Breakfast: 280kcals
Lunch: 420kcals
Dinner: 420kcals
Snacks and drinks: 280kcals

Men
(based on an average of 1,900kcals a day)
Breakfast: 380kcals
Lunch: 570kcals
Dinner: 570kcals
Snacks and drinks: 380kcals

The app was then updated on 31 August 2020 to include a tailored calorie recommendation. This recommendation was based on the information inputted by the user in the BMI calculator. The tailored calorie recommendation was given as a range between 0.7 and 0.9 of the users estimated average recommendation (EAR). This was to account for the calorie deficit needed for weight loss. The user was then able to choose their own daily calorie goal within this range.

Weekly guides

Users were guided towards a balanced diet through magazine style weight management guides. These guides were based on the information in NHS England's original 12-week weight loss plan. Updated information was also added to these guides in line with Government recommendations on healthy eating, including the eatwell guide.

Appendix 3: Data cleaning protocol

Inclusion and exclusion criteria

In order to be included in the analysis users must have a first activity date at least 12 weeks earlier than data extraction

Where users reported either a weight change of greater than 5% in any one week, or 20% in total, these weights were excluded from the analyses. This resulted in less than 1% of users who were excluded.

In line with the PHE 'Standard Evaluation Framework' for Weight Management Interventions' (6), users were classified into 2 groups and compared based on their weight outcomes:

1. Starters: users who recorded at least a start and end weight in week 1. This included completers.
2. Completers: users who recorded a start and end weight in week 1 and week 12, as well as their weight at the end of at least 9 (75%) of the 12 weeks.

Weight change and app usage measurements

Self-reported weight change over the 12 weeks was calculated as follows:

*   the initial weight was the first occurrence of a week 1 start weight
*   the final weight was the first occurrence of the end of week weight for the farthest week entered by that user, as long as this was not on an earlier date than the week 1 start

Percentage body weight change was classified as weight gain, 0 to 2.9% weight loss, 3 to 4.9% weight loss, 5 to 9.9% weight loss, 10% or more weight loss.

Number of sessions (that is, app use), days of sessions (days using the 12-week plan), amount of calories and physical activity entered were calculated.

Weight change and user engagement were examined for each grouping factor, adjusting for other demographic grouping factors (gender, age group, BMI group, ethnicity group) by a linear model with main effects for these factors. Statistical significance was assessed using the F-statistic.

Missing data

Where gender, age or BMI were missing we defined an additional 'Unknown' group. Very few of these users started or completed the 12-week plan. There were no missing entries for ethnic group, though one of the groups returned by the 12-week plan was 'Not stated', which was

maintained as a separate group. Imputation of these missing data was not attempted as they were nearly always all missing if any of one of them were, and so there was no information on which to base an imputation.

Missing weights occurred when users did not continue to enter them for the full 12-week plan. We wished also to report an Intention to Treat analysis of the effectiveness of the 12-week plan in all users who started using it, so imputed these missing weights. Two imputation methods were used: Last Observation Carried Forward (LOCF) and Baseline Observation Carried Forward (BOCF). LOCF and BOCF were calculated for starters only as final weights were recorded in completers (as per completer definition).

Where users' final weight was missing 2 imputation methods were used: Last Observation Carried Forward (LOCF) and Baseline Observation Carried Forward (BOCF). LOCF and BOCF were calculated for starters only as final weights were recorded in completers (as per completer definition).

Both BOCF and LOCF are calculated and included in Table 2. For this evaluation (in line with typical reporting of weight management outcomes (18)) LOCF is used as the main measure for outcome weight change for all users who started the 12-week plan.

App use data

Information recorded about app use (days and times of sessions) was assumed to be correct. Information entered by the users was all self-reported, and so none of it could be independently verified. We rejected any weight change over 12 weeks that exceeded 20% (gain or loss). Weight changes in excess of 5% in one week were considered implausible, and so any records where this was exceeded in the first week was also rejected, because of the importance of the initial weight. Any records with an initial weight less than 20kg was rejected. Although these users with implausible weights and changes were omitted from reported means, they were included in counts of starters and completers

Any total daily calories in excess of 10,000kcal was rejected.

Appendix 4: Mean weight change for starters and completers overall and by gender, age, BMI and ethnicity

Category	Demographic	Starters		Completers
		Mean change in weight kg (CI) [Last Observation Carried Forward]	Mean change in weight kg (CI) [Baseline Observation Carried Forward]	Mean change in weight kg (CI)
	Overall	-2.12 (-2.14, -2.09)	-0.71 (-0.72, -0.69)	-5.8 (-5.89, -5.71)
Gender	Female	-1.91 (-1.94, -1.89)	-0.6 (-0.62, -0.59)	-5.42 (-5.51, -5.32)
	Male	-3.18 (-3.24, -3.12)	-1.23 (-1.27, -1.19)	-7.04 (-7.21, -6.86)
Age	18 to 29	-1.97 (-2.03, -1.92)	-0.49 (-0.53, -0.45)	-6.48 (-6.73, -6.24)
	30 to 39	-2.14 (-2.2, -2.09)	-0.58 (-0.62, -0.54)	-6.72 (-6.96, -6.48)
	40 to 49	-2.16 (-2.21, -2.1)	-0.67 (-0.71, -0.63)	-6.15 (-6.35, -5.95)
	50 to 59	-2.15 (-2.2, -2.1)	-0.81 (-0.84, -0.77)	-5.64 (-5.8, -5.49)
	60 and over	-2.18 (-2.24, -2.12)	-0.99 (-1.04, -0.95)	-5.02 (-5.18, -4.86)
BMI	Under 25	-1.26 (-1.35, -1.17)	-0.44 (-0.51, -0.37)	-3.51 (-3.87, -3.15)
	25 to 29.9	-1.86 (-1.9, -1.82)	-0.66 (-0.69, -0.63)	-4.99 (-5.12, -4.86)
	30 to 34.9	-2.19 (-2.24, -2.15)	-0.73 (-0.76, -0.69)	-6.17 (-6.32, -6.01)
	35 to 39.9	-2.42 (-2.48, -2.36)	-0.82 (-0.87, -0.78)	-7 (-7.22, -6.78)
	40 to 100	-2.87 (-2.94, -2.8)	-0.82 (-0.87, -0.77)	-7.95 (-8.23, -7.66)
	Not stated	**-16.22 (-20.63, -11.81)**	-0.01 (-2.33, 2.32)	

Category	Demographic	Starters		Completers
		Mean change in weight kg (CI) [Last Observation Carried Forward]	Mean change in weight kg (CI) [Baseline Observation Carried Forward]	Mean change in weight kg (CI)
Ethnicity	Bangladeshi	-1.72 (-2.17, -1.27)	-0.5 (-0.83, -0.16)	-4.05 (-5.95, -2.15)
	Black African	-2.23 (-2.51, -1.95)	-0.74 (-0.94, -0.53)	-6.16 (-7.2, -5.11)
	Black Caribbean	-1.83 (-2.12, -1.54)	-0.65 (-0.86, -0.43)	-4.18 (-5.1, -3.25)
	Chinese	-2.19 (-2.87, -1.52)	-1 (-1.49, -0.5)	-4.42 (-6.38, -2.45)
	Indian	-1.86 (-2.05, -1.67)	-0.65 (-0.8, -0.51)	-4.6 (-5.25, -3.95)
	Middle Eastern	-2.24 (-2.74, -1.75)	-0.66 (-1.03, -0.3)	-5.41 (-7.2, -3.62)
	Mixed	-2.08 (-2.29, -1.87)	-0.76 (-0.91, -0.61)	-5.28 (-6.07, -4.49)
	Pakistani	-1.92 (-2.17, -1.66)	-0.62 (-0.81, -0.43)	-4.92 (-5.93, -3.91)
	White	-2.14 (-2.16, -2.11)	-0.71 (-0.73, -0.69)	-5.86 (-5.96, -5.76)
	Other	-1.93 (-2.21, -1.66)	-0.57 (-0.77, -0.36)	-4.71 (-5.76, -3.67)
	Not stated	-2.1 (-2.16, -2.05)	-0.7 (-0.75, -0.66)	-5.87 (-6.07, -5.67)

Notes

Explanations of 'Last Observation Carried Forward' and 'Baseline Observation Carried Forward' are given in Appendix 3.

'Not stated' indicates that users did not select an option in the 12-week plan.

Weight changes in starters and completers represent a significant reduction in weight in all sociodemographic breakdowns except for 'BMI Not stated' (highlighted in bold).

Appendix 5: Drop-off in users by gender, BMI and age

Note: 'not stated' indicates that users did not select an option in the 12-week plan.

Category	Demographic	Downloaded (%)	Started (%)	Completed (%)	% Drop download to starter	% Drop starter to completer
	N	864,403 (100)	68,942 (100)	8,305 (100)	-92.0	-88.0
Gender	Females	592,049 (81.5)	57,627 (83.6)	6,322 (76.1)	-90.3	-89.0
	Males	134,158 (18.5)	11,315 (16.4)	1,983 (23.9)	-91.6	-82.5
	Not stated	138,196	0	0	0	0
Age	18 to 29	188,744 (26.0)	13,624 (19.8)	988 (11.9)	-92.8	92.8
	30 to 39	143,868 (19.8)	12,676 (18.4)	1,056 (12.7)	-91.2	-91.7
	40 to 49	140,507 (19.3)	13,905 (20.2)	1,505 (18.1)	-90.1	-89.2
	50 to 59	153,929 (21.2)	17,325 (25.1)	2,450 (29.5)	-88.7	-85.9
	60 and over	99,129 (13.7)	11,412 (16.6)	2,306 (27.8)	-88.5	-79.8
	Not stated	138,196	0	0	0	0
BMI	Under 25	85,546 (11.8)	4,637 (6.7)	475 (5.7)	-94.6	-89.8
	25 to 29.9	240,927 (33.2)	26,220 (38.0)	3,506 (42.2)	89.1	-86.6
	30 to 34.9	194,671 (26.8)	19,708 (28.6)	2,386 (28.7)	-89.9	-87.9
	35 to 39.9	113,446 (15.6)	10,437 (15.1)	1,185 (14.3)	-90.8	-88.7
	40 to 100	91,536 (12.6)	7,935 (11.5)	752 (9.1)	-91.3	-90.5
	Not stated	138,277	5	1	0	0
Ethnicity	Bangladeshi	2,790 (0.4)	197 (0.4)	17 (0.2)	-92.9	-91.4

Category	Demographic	Downloaded (%)	Started (%)	Completed (%)	% Drop download to starter	% Drop starter to completer
	Black African	7,905 (1.1)	514 (0.9)	54 (0.8)	-93.5	-89.5
	Black Caribbean	5,566 (0.8)	468 (0.8)	68 (1.0)	-91.6	-85.5
	Chinese	1,106 (0.2)	90 (0.2)	15 (0.2)	-91.9	-83.3
	Indian	16,126 (2.3)	1,076 (1.9)	142 (2.1)	-93.3	-86.8
	Middle Eastern	2,749 (0.4)	164 (0.3)	18 (0.3)	-94.0	-89.0
	Mixed	9,766 (1.4)	916 (1.6)	94 (1.4)	-90.6	-89.7
	Pakistani	10,452 (1.5)	604 (1.1)	59 (0.9)	-94.2	-90.2
	White	510,161 (71.2)	51,584 (91.9)	6,287 (91.7)	-89.9	-87.8
	Other	8,087 (1.1)	517 (0.9)	55 (0.8)	-93.6	-89.4
	Not stated	151,499	12,812	1,496	-91.5	-88.3

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-leading science, research, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

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