AUTHOR QUERY FORM

ELSEVIER	**Journal:** PUHE **Article Number:** 3147	**Please e-mail your responses and any corrections to:** **E-mail:** corrections.eseo@elsevier.tnq.co.in

Dear Author,

Please check your proof carefully and mark all corrections at the appropriate place in the proof (e.g., by using on-screen annotation in the PDF file) or compile them in a separate list. **It is crucial that you NOT make direct edits to the PDF using the editing tools as doing so could lead us to overlook your desired changes.** Note: if you opt to annotate the file with software other than Adobe Reader then please also highlight the appropriate place in the PDF file. To ensure fast publication of your paper please return your corrections within 48 hours.

For correction or revision of any artwork, please consult http://www.elsevier.com/artworkinstructions.

Any queries or remarks that have arisen during the processing of your manuscript are listed below and highlighted by flags in the proof.

Location in article	Query / Remark: Click on the Q link to find the query's location in text Please insert your reply or correction at the corresponding line in the proof
Q1	The article title has been changed. Please check, and correct if necessary.
Q2	Please check the Tel. no, and amend if necessary.
Q3	Please check for clarity of the sentence "Common components..."
Q4	Please provide the expansion for GP and NICE in the sentence "This forms the..."
Q5	Please provide the expansion for PCT in the sentence "Data from..."
Q6	Please check the edit made to the sentence "The average..." and amend if necessary.
Q7	Please provide a definition for the significance of bold in Table 1, if any.
Q8	Please confirm that given names and surnames have been identified correctly and are presented in the desired order and please carefully verify the spelling of all authors' names.
	Please check this box or indicate your approval if you have no corrections to make to the PDF file ☐

Thank you for your assistance.

PUBLIC HEALTH XXX (2018) 1

Available online at www.sciencedirect.com

Public Health

journal homepage: www.elsevier.com/puhe

Highlights

- There is considerable variation in the National Health Service Health Check programme nationally.
- Problems around data quality are also highlighted.
- Self-reported data have implications for the accuracy of local and national reporting.
- Issue is currently being looked at by Public Health England.

https://doi.org/10.1016/j.puhe.2018.01.024

Please cite this article in press as: Riley VA, et al., Understanding implementation and uptake in the National Health Service Health Check Programme, Public Health (2018), https://doi.org/10.1016/j.puhe.2018.01.024

PUBLIC HEALTH XXX (2018) 1–4

Available online at www.sciencedirect.com

Public Health

journal homepage: www.elsevier.com/puhe

Short Communication

Understanding implementation and uptake in the National Health Service Health Check Programme

V.A. Riley*, C. Gidlow, N.J. Ellis

Staffordshire University, School of Life Sciences and Education, Leek Road, Stoke-on-Trent, Staffordshire, ST4 2DF, United Kingdom

ARTICLE INFO

Article history:
Received 26 October 2017
Received in revised form
23 January 2018
Accepted 25 January 2018
Available online xxx

ABSTRACT

Objectives: We present findings from a national online survey of uptake and implementation of the National Health Service Health Check (NHSHC) programme. The research aimed to understand national variation in implementation of NHSHCs and explore the relationship between uptake and different components of implementation.

Study design: The study design was a descriptive online survey.

Methods: Data were collected via an online survey between November 2015 and August 2016. The survey was distributed nationally to practice managers in the Midlands and East of England, South of England, North of England and London via local NHSHC leads with the help of the national programme manager.

Results: Responses were received from 153 participants, half of who were practice managers (49.7%). Common components of implementation included using postal invitations accompanied by the national leaflet, NHSHCs delivered routinely with other appointments, offering NHSHC outside of working hours and with blood samples taken during the consultation. Meaningful exploration of the relationship between uptake and components of implementation was not possible given the inaccuracy of self-reported uptake data, which was confirmed by comparison with public health data in a subsample ($n = 18$). The comparison also found that a number of practices were reporting more completed health checks than the total number of patients invited, which again indicates problems that may have implications for uptake figures locally and nationally.

Conclusions: Overall, our findings showed considerable variation in the implementation of NHSHCs on a national scale and issues with quality of programme uptake data, which has implications for national reporting for NHSHC.

National Health Service Health Check (NHSHC) is a national programme to identify and manage cardiovascular disease (CVD) risk in adults aged 40–74 years in England. All eligible adults should be invited for an NHSHC where CVD risk is assessed based on measurements including blood pressure, cholesterol and other patient information (e.g. age, gender, family history, smoking status). This forms the basis for a discussion around managing risk through lifestyle advice,

* *Corresponding author*. Staffordshire University, Brindley Building (B178), Leek Road, Stoke-on-Trent, Staffordshire, ST4 2DF, United Kingdom. Tel.: +44 1782 295810.
E-mail addresses: Victoria.Riley@staffs.ac.uk (V.A. Riley), c.gidlow@staffs.ac.uk (C. Gidlow), n.j.ellis@staffs.ac.uk (N.J. Ellis).

https://doi.org/10.1016/j.puhe.2018.01.024
0033-3506/

referral back to the GP or other services, where possible, based on NICE guidance.

Nationally, uptake of NHSHC remains below 75% on which the original economic model was based.[1] Best practice guidelines have been available to support the implementation of NHSHC since 2009, but local authorities are given autonomy to design and implement the programme in a way that meets the needs of the local population. This has inevitably led to varied implementation throughout the country, both across regions and between individual general practices. Data from eight PCTs (in 2010)[2] and 99 practices in London[3] and 13 practices in Sefton[4] indicated a number of variations including the budgets for NHSHC; approaches to delivery; payments made to general practices; evaluation and monitoring; tools used to estimate CVD risk and services available for referral postcheck.[2] Training given to staff involved in NHSHC also differed. Some, but not all, general practices included: measurement methods (43%); communicating risk (65%) and advice about lifestyle change (62%).[3] Variation between practices and individual health professionals in the delivery of NHSHC has also been identified in the recording of medical and lifestyle information, advice given to patients, requested tests and lifestyle support referrals.[4] Units of alcohol consumed, body mass index, smoking status, levels of physical activity, blood pressure and cholesterol were only recorded in 45.3% of patients with marked variance in lifestyle advice and referrals between practices and health professionals.[4] Aside from the differences in the consultation, it is also important to understand disparities in the organisation and implementation of NHSHC as this is likely to influence uptake. This article explores uptake, implementation and reporting of uptake data for the programme.

This short report presents findings from an online survey on uptake and implementation of NHSHC. The survey was informed by previous research[4,5] and discussion with public health NHSHC leads. Survey questions focussed on uptake and programme implementation (e.g. invitation method, staffing, advertisement and appointments). Typically, closed questions were used, ending with an open question allowing respondents to leave additional comments and information.

There were two main aims: (i) to understand national variation in NHSHC implementation (ii) to explore the relationship between NHSHC uptake and different components of implementation.

National variation in NHSHC implementation

Data were collected through an online survey, which was distributed nationally to practice managers (November 2015–August 2016), with the help of the national programme manager and regional NHSHC leads. A number of NHSHC national lead meetings and steering groups were also attended to encourage participation. Over 10 months, 454 responses were initiated and 112 were completed. Additional responses were received via paper (n = 17) and telephone (n = 26), giving 153 responses in total. Respondents were most commonly practice managers (49.7%), health care assistants (16.3%) and 'others' (17%), which included administrators and data quality staff. Almost half of the responses received were from the Midlands and East of England (n = 72), followed by the South of England (n = 31), North of England (n = 30) and London (n = 19). Mean NHSHC uptake reported by respondents was 47.09%, which was in line with the national average for the corresponding year (48.3%, 15/16 data—www.healthcheck.nhs.uk/). Respondents represented a range of practices in terms of practice size (mean 8202, range 1650–36000), patients registered White British (mean 78.91%, range 12.3–99%), GP population aged 40–74 (mean 41.05%, range 7.86–55.56%) and deprivation of practice location based on the Index of Multiple Deprivation (most deprived to least deprived quintile, Q1 = 27.5%, Q2 = 24.1%, Q3 = 17.4%, Q4 = 17.4%, Q5 = 13.5%).

As reported elsewhere,[6] letters were the most common method of invitation, although most respondents reported use of multiple methods (Table 1). Of those that sent a postal invitation, the majority included the national NHSHC leaflet (n = 152). Other methods to invite patients for a NHSHC included telephone (52%) and text messages (22%). Research that has looked at invitation methods has suggested that telephone invitations are associated with higher uptake than postal,[7] and the combination of a postal invitation and text messaging improves uptake.[8]

The average number of practice staff involved in the invitation process was 2.7% (n = 147), most commonly administrative staff (n = 153). Sixty-two percent stated that NHSHCs were routinely implemented with other appointments (e.g. prescription review, vaccinations), whereas 33% ran NHSHC-specific clinics and 5% used both. Despite limited investigation of prebooked appointments, which have shown the method to be effective,[9] just 11% of practices adopted this method alone or in combination with a letter requesting a patient to book an appointment (26%; n = 152). More respondents in London chose to adopt both methods (58%) instead of leaving it to the patient to book the appointment (21%). Nearly three-quarters of practices offered NHSHC appointments to patients after working hours. Blood sampling varied between practices; half reported taking blood samples during the NHSHC (not in advance) in line with previous research.[6] Although a single appointment method may be more effective for uptake, it precludes the discussion of CVD risk during the health check if the practice does not use point-of-care testing. Eighty-six percent of practices advertised NHSHCs in surgery. Strategies included posters, TV monitors, practice websites, newsletters, on prescriptions, via social media and leaflets in the waiting area (n = 121).

Perceptions of the programme were mixed. Respondents from the South of England were less inclined to perceive health checks as 'very' or 'extremely' important compared with those from London. When asked to list three services to which practice gave highest priority, 20% of respondents included NHSHCs, although this varied by region (e.g. lower priority in the South of England). Although other services such as asthma clinics and sexual health are undoubtedly important, the results may indicate a lower perceived importance of preventive services. The findings show a large variation in the perceived importance, effectiveness and priority of NHSHCs nationally, which is in line with the findings of Krska, du Plessis and Chellaswamy,[6] who found

Please cite this article in press as: Riley VA, et al., Understanding implementation and uptake in the National Health Service Health Check Programme, Public Health (2018), https://doi.org/10.1016/j.puhe.2018.01.024

Table 1 – Implementation characteristics and perceptions of NHS Health Checks.

Implementation characteristics	Total responses ($n = 153$)		Midlands and East of England ($n = 72$)		North of England ($n = 30$)		South of England ($n = 31$)		London ($n = 19$)	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Invited by										
Letter	123	**80**	57	**79**	26	**87**	26	**84**	13	**68**
Telephone	79	**52**	43	**60**	18	**60**	2	**7**	15	**79**
Letter followed by telephone	32	**21**	16	**22**	8	**27**	3	**10**	4	**21**
Text	34	**22**	16	**22**	11	**37**	0	**0**	7	**37**
Opportunistic invitation	92	**60**	45	**63**	20	**67**	14	**45**	13	**68**
Included national leaflet in postal invitation	92	**61**	48	**67**	17	**57**	22	**71**	4	**21**
Invite patients up to three times	71	**46**	31	**43**	20	**67**	11	**36**	8	**42**
Implement health checks routinely in current practice	95	**62**	46	**64**	21	**70**	15	**48**	12	**63**
Leave it to patients to make an appointment	95	**62**	48	**67**	17	**57**	26	**84**	4	**21**
Offer health checks										
After work (5pm)	110	**72**	49	**68**	25	**83**	22	**71**	14	**74**
Before work (9am)	85	**56**	38	**53**	73	**73**	16	**52**	8	**42**
At weekends	18	**12**	9	**13**	2	**7**	0	**0**	7	**37**
Take the blood sample during the health check appointment	84	**55**	36	**50**	11	**37**	25	**81**	11	**58**
Advertise NHS Health Checks in practice	132	**86**	62	**86**	26	**87**	27	**87**	16	**84**
HCs were 'very' or 'extremely' important	76	**50**	36	**50**	19	**63**	7	**23**	13	**68**
HCs were 'effective' or 'very effective'	74	**48**	35	**49**	11	**37**	14	**45**	14	**74**
HCs included in top three prioritised services	31	**20**	16	**22**	4	**13**	2	**7**	8	**42**

NHS, National Health Service; HCs, Health Checks.

that just over half of GPs perceived the programme as important and beneficial to patients.

Self-reported uptake

Owing to anomalies and missing self-reported uptake data, where possible, responses were compared with general practice uptake data accessed from a subsample of two local authorities to check accuracy. Comparisons were conducted between local authority and self-reported uptake data for 18 practices within the two areas. Of these, only two practices reported uptake that was in line with corresponding practice public health data. Self-reported data from 12 respondents did not match data held by public health with three respondents self-reporting percentage uptake above that reported by public health (variation mean 3%, range 1–5%) and nine respondents self-reporting percentage uptake below that held by public health (variation mean 15%, range 2–34%).

We were unable to compare data for four respondents as public health data suggested that the practice had completed more health checks than total number of patients invited. This suggested that practices have difficulty in accurately recording and reporting the number of patients invited for a health check, whether by letter, telephone, text, email or opportunistically. As a result, univariate analysis could not be conducted due to inaccuracy of self-reported uptake.

Implementation and implication of self-reported uptake

Overall, our data show considerable variation in programme implementation, which is consistent with previous research.[2–4,6,10] There is evidence of relative consistency in use of the national leaflet in postal invitations, offering health check appointments outside of working hours and advertising the programme in the waiting area. All of which may be important for improving uptake for the programme.

There are clearly issues around data quality and performance indicators. The marked discrepancy between self-reported NHSHC uptake and that collated by the corresponding local authority highlighted issues in the accuracy of recording. For the present study, the accuracy of reported uptake data prevented meaningful analysis of which aspects of delivery were associated with high/low uptake (our secondary aim). Moreover, this broader issue is important in practical terms given that some localities still rely on self-reported data for local and national reporting. We were unable to calculate uptake for a number of general practices due to insufficient public health data, potentially due to miscoding of opportunistic invitations, which again has implications for national reporting. Therefore, accuracy of recording needs to be improved before this type of analysis can be conducted. This is a broader issue currently being looked at by Public

Please cite this article in press as: Riley VA, et al., Understanding implementation and uptake in the National Health Service Health Check Programme, Public Health (2018), https://doi.org/10.1016/j.puhe.2018.01.024

Health England through use of a national data extraction 'to monitor the programme and help local commissioners and service providers address variation by locality and across different patient groups' (NHSHC e-bulletin October 2017—www.healthcheck.nhs.uk/).

Author statements

Acknowledgements

The authors would like to acknowledge Jamie Waterall, NHS Health Check leads who helped to distribute the survey and all participants.

Ethical approval

None sought.

Funding

None declared.

Competing interests

None declared.

REFERENCES

1. Department of Health. *Economic modelling for vascular checks*. 2008. Available from: http://www.nhshealthcheck.nhs.uk/i/assets/Economic.Modelling.pdf.
2. Graley CE, May KF, McCoy DC. Postcode lotteries in public health – the NHS Health Checks Programme in North West London. *BMC Publ Health* 2011;**11**(1):738.
3. Nicholas JM, Burgess C, Dodhia H, Miller J, Fuller F, Cajeat E, et al. Variations in the organization and delivery of the 'NHS health check' in primary care. *J Public Health* 2013;**35**(1):85–91.
4. Krska J, du Plessis R, Chellaswamy H. Implementation of NHS Health Checks in general practice: variation in delivery between practices and practitioners. *Prim Health Care Res Dev* 2015:1–8 (April 2009).
5. Sargeant LA, Simmons RK, Barling RS, Butler R, Williams KM, Prevost AT, et al. Who attends a UK diabetes screening programme? Findings from the ADDITION-Cambridge study. *Diabet Med* 2010;**27**(9):995–1003.
6. Krska J, du Plessis R, Chellaswamy H. Views of practice managers and general practitioners on implementing NHS health checks. *Prim Health Care Res Dev* 2016;**17**(2):198–205.
7. Gidlow C, Ellis N, Randall J, Cowap L, Smith G, Iqbal Z, et al. Method of invitation and geographical proximity as predictors of NHS health check uptake. *J Public Health* 2015;**37**(2):195–201.
8. Alpsten BT. Saving lives through effective patient engagement around NHS health checks. *Clin Gov* 2015;**20**(3):108–12.
9. Local Government Association. *Checking the health of the nation: implementing the NHS Health Check Programme studies – Southwark*. 2015. Available from: https://www.local.gov.uk/sites/default/files/.../implementing-nhs-health-c-6a7.pdf.
10. Usher-Smith J, Martin A, Harte E, MacLure C, Meads C, Saunders C, et al. *NHS Health Check programme rapid evidence synthesis*. 2017 (January). Available from: www.healthcheck.nhs.uk/document.php?o=1251.