

The impact of a television soap opera on the NHS Cervical Screening Programme in the North West of England

Andy Howe, Vicci Owen-Smith and Judith Richardson

Abstract

Background Mass media interventions can influence health care utilization but the effect of televised fictional accounts of illness upon national screening programmes is unknown. Our aim was to evaluate the impact of a *Coronation Street* story line, in which one of the characters died from cervical cancer, on the National Health Service (NHS) Cervical Screening Programme.

Methods The study involved a retrospective analysis of information held on cervical screening databases ('Exeter' computer systems) of the nine Health Authorities constituting the Lancashire and Greater Manchester zones of the North West Region of the NHS. The number of cervical smears performed in the community, in women over 25 years of age, whose previous smear was normal and who were on routine recall, during a 6 month period that included the story line, was compared with those taken over the same period in the previous year. The proportions of smears classified by a screening interval of 'unscheduled', 'on time', 'overdue' or 'no previous smear' were compared.

Results The number of smears performed increased from 65 714 in 2000 to 79 712 in 2001, an increase of 13 998 (21.3 per cent; 95 per cent confidence interval (CI) 21.0–21.6 per cent) in the 19 weeks after the story line. The increase in the number of smears occurred in all categories of screening interval, with the largest increase seen in those attending 'on-time' (26 per cent).

Conclusions We have demonstrated a large impact of a soap opera story line on the cervical screening programme although the benefit to health is not clear. Further research will determine the long-term effect of the story.

Keywords: cervical screening, television, evaluation

Introduction

The National Health Service (NHS) Cervical Screening Programme aims to reduce the incidence of and mortality caused by invasive cervical cancer in the United Kingdom.¹ Achieving this aim depends on adequate coverage of the target population without performing unnecessary smears.^{2–4}

The potential for entertainment television to promote health is well recognized,^{5,6} and there is evidence that mass media

interventions can influence health care utilization.⁷ However, few studies have evaluated the impact of televised fictional accounts of illness on subsequent use of health services and those studies examining the portrayal of suicidal behaviour have shown contradictory results.^{8,9}

Although the determinants of screening uptake and interventions for increasing screening uptake have been recently reviewed,¹⁰ we could identify no previous study that evaluated the effect of a fictitious television story on a national screening programme.

In April 2001 a story line was introduced into the television soap opera *Coronation Street*, in which one of the central characters developed cervical cancer. There was a fear amongst health professionals that this story would reduce the number of women attending for a cervical smear, and thus decrease coverage.¹¹ As the story line unfolded we became aware that, with a large increase in the number of smears being taken, the time taken for laboratories to report results increased to beyond acceptable quality assurance limits.¹² The aim of this study was to evaluate the impact of the story line on the NHS cervical screening programme.

The television programme

Coronation Street is a UK television 'soap opera' broadcast four times per week that regularly polls over 13 million viewers per episode. The story line was introduced on 25 April 2001 when, following a 'mistake' at the local laboratory, 'Alma' (a well-known character) was required to have a repeat cervical smear. On 4 May she was diagnosed with cervical cancer. Although the 'mistake' was not explained in detail, it also became apparent that 'Alma' had missed previous smears. During

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subsequent episodes 'Alma's' condition deteriorated rapidly. Her situation was featured in 23 of the following 32 episodes, and within 6 weeks (17 June 2001) she was dead.

Methods

The study was performed on the population eligible for cervical screening in the nine Health Authorities constituting the Lancashire and Greater Manchester zones of the North West Region of the NHS.

A retrospective analysis of information held on each Health Authority cervical screening database ('Exeter' computer system) for the period 26 February–12 August 2001, as well as a comparison period, 28 February–13 August 2000 (i.e. calendar weeks 9–32) was performed. The following information was abstracted: date, location and result of the first smear taken in the study period; date, result and recall code of the most recent previous smear; date of birth, electoral ward of residence and date of registration onto the database. We ascribed a Townsend deprivation score and a calculated rank quintile of deprivation within the North West region to each case, using the electoral ward of residence. We entered the data into SPSS (version 10) for analysis and compared the number of smears performed in 2001 with that in 2000.

The story line started soon after Easter in 2001. Bank Holiday working days lost have a large impact on weekly smear rates. Therefore, to ensure that data from the two years were comparable, we restricted detailed analysis to calendar weeks 14–32 to include the last complete week before Easter in either year (2 April–12 August 2001 and 3 April–13 August 2000).

We excluded from the main analysis women whose smears were performed in hospitals (potentially as a result of symptoms); those women who had never had a previous smear but had been registered on the database less than 12 months before the recent smear (thus 'allowing' women 12 months after registration to attend for their first smear, before classifying them as 'no previous smear'); and women under the age of 25 (in line with national reporting of cervical screening coverage¹³).

Our study population for the main analysis included women whose recent smear had been performed in a community setting (general practices and clinics), women whose previous smear result had been negative and who had been placed on 'routine' recall (i.e. not being followed up early as a result of a previous abnormality) and women over the age of 25.

National coverage statistics for the NHS screening programme are based on a 5 year (60 month) period.¹³ Although some Health Authorities in the North West administer a 3 year recall programme we wanted to evaluate the impact upon the programme in line with national recommendations that all eligible women should have a cervical smear at 3–5 year intervals. Therefore, we used the following classification to determine whether the story line had the same impact on women attending as 'unscheduled', 'on-time' or 'overdue': an 'unscheduled' smear was defined as one that was performed before 36 months, an

'on-time' smear as one performed between 36 and 60 months, and an 'overdue' smear one that was performed 60 months or more since the last smear.¹⁴ We categorized the results of 'moderate dyskariosis', 'severe dyskariosis', 'severe/?invasive carcinoma' and '?glandular neoplasia' as 'potentially significant abnormalities'.¹³ For further analysis we categorized women into two age groups: 25–44 years and 45 years or older.

To focus on the potential health benefits of the story line we also looked at women who had abnormal results reported at the previous smear, to investigate the relationship between the story line and re-attendance. Women who have a smear reported as 'borderline', 'inadequate' and 'mild dyskariosis', for whom the appropriate action is early recall, are advised to re-attend for a repeat smear at periods of up to 6 months.¹⁴ If the woman does not attend in response to her early recall invitation, she is re-invited at 12 months from the date that the early recall smear is due.¹⁴ For further analysis we thus classified these women as 'returning on time' (within 12 months of their specified return date) and 'returning late' (more than 12 months after their return date).

Finally, women under the age of 25 were analysed separately.

Results

Altogether 320 128 records of women having cervical smears (weeks 9–32: 26 February–12 August 2001 and 28 February–13 August 2000) were extracted from the cervical screening databases.

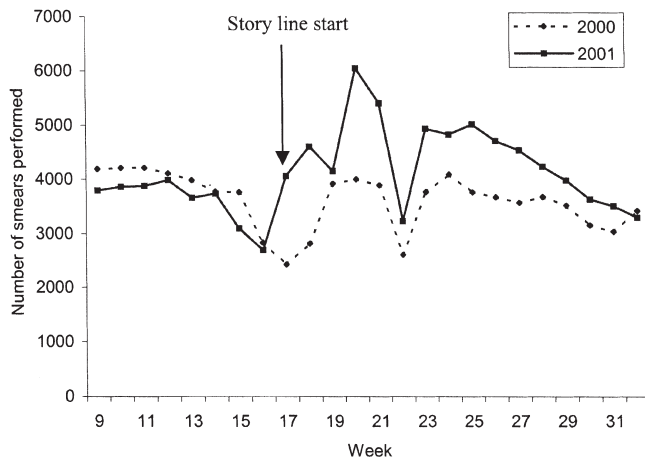
Women with previously negative smears on routine recall

Of the 320 128 smears, 185 310 were performed in a community setting, on women aged 25 or over who had had a previous negative smear (and on routine recall) or, if they had had no previous smear, had been registered on the database for at least 12 months before the most recent smear. Table 1 indicates the number excluded before this analysis. The variation in the number of smears performed comparing 2000 with 2001 is shown in Fig. 1. Although the numbers of smears performed between weeks 9 and 14 are similar, there is a sharp increase in the number of smears following week 17, the first episode including the 'Alma' story line, and this increase is sustained until a tailing off in mid-August (week 32), 6 weeks after 'Alma's' death. Easter (a week later in 2000 than 2001), May Day and the Spring Bank Holidays directly correspond to the troughs in the number of smears performed.

Of the 185 310 smear results, 145 426 were performed during the study period (weeks 14–32). Of these, 65 714 were performed in 2000 compared with 79 712 in 2001, an increase of 13 998 (21.3 per cent; 95 per cent confidence interval (CI) 21.0–21.6 per cent). The increase in the number of smears performed occurred in all of the Health Authorities (Table 2) although the scale of the increase varied from 11 per cent to 32 per cent, with a larger

Table 1 Number of smears excluded from further analysis (number extracted from database was 320 128)

Inclusion	No. excluded	Remaining total
Smear performed in community	32 267	287 861
If no previous smear registered on the database for at least 12 months before the most recent smear	6759	281 102
Aged 25 or over	31 895	249 207
Previous negative smear and on routine recall	63 897	185 310
Weeks 14–32	39 884	145 426

**Fig. 1** Number of smears performed on the eligible population of the nine Health Authorities during weeks 9–32 in 2000 and 2001 ($n = 185\,310$).**Table 2** The number of smears performed in each Health Authority (weeks 14–32) ($n = 145\,426$)

	2000	2001	Difference; number (%)
South Lancashire	6141	7233	1092 (18)
North West Lancashire	7739	8576	837 (11)
East Lancashire	9611	11 034	1423 (15)
Manchester	5135	6597	1462 (28)
Salford and Trafford	6113	7356	1243 (20)
Stockport	4623	5833	1210 (26)
West Pennine	8872	10 867	1995 (22)
Bury and Rochdale	6537	7792	1255 (19)
Wigan and Bolton	10 943	14 424	3481 (32)
Total	65 714	79 712	13 998 (21)
Greater Manchester total	42 223	52 869	10 646 (25)
Lancashire total	23 491	26 843	3352 (14)

increase seen across Greater Manchester than Lancashire. Increases occurred in all age groups and were independent of the extent of deprivation.

The increase in the number of smears occurred in all categories of screening interval, with the largest increase seen in those attending 'on-time' (Table 3). It is of note that the pro-

Table 3 Classification by interval between smears (weeks 14–32) ($n = 145\,426$)

	2000	2001	Change; number (%)
Unscheduled	13 951	15 983	2032 (15)
On time	38 567	48 489	9922 (26)
Overdue	11 957	13 838	1881 (16)
No previous smear	1239	1402	163 (13)
Total	65 714	79 712	13 998 (21)

portional increase in women attending for 'unscheduled' smears was much larger in those over the age of 45 than in those aged 25–44 (difference in proportions 15 per cent; 95 per cent CI 13–16 per cent) (Table 4). Conversely, the increase in 'overdue' smears was much larger in those women aged 25–44 than in those over the age of 45 (difference in proportions 12 per cent; 95 per cent CI 11–13 per cent).

Table 5 shows that whereas the proportion of smears that show a 'potentially significant abnormality' remains the same, 65 more cases had abnormalities requiring further action in 2001 compared with 2000. Of these 65, four more cases of a 'potentially significant abnormality' occurred in women who had had no previous smear (26 cases in 2000 and 30 cases in 2001).

Women with previous abnormal smears recalled early

Of the 287 861 women attending for smears in the community, during the study period (week 14–32) 22 325 women had a result at the previous smear reported as 'borderline', 'inadequate' and 'mild dyskariosis' and had been recalled early for a repeat smear between 1 and 6 months; this represented an increase of 2129 (21 per cent, 95 per cent CI 20–22 per cent) between 2000 and 2001. The number of women 'returning late' for a repeat smear increased by 391 (27 per cent) from 2000 to 2001 (Table 6).

Women under the age of 25

A significantly greater number of women under 25 attended for cervical smears in 2001 (9242) than in 2000 (7908), a difference of 1334 (17 per cent; 95 per cent CI 16–18 per cent). This was less of an increase than in women over the age of 25. As expected,

Table 4 Classification by interval between smears and age group (weeks 14–32) (*n* = 145 426)

	'Unscheduled'	'On time'	'Overdue'	'No previous smear'	Total
<i>25–44 years</i>					
2000	8622	22 740	5737	958	38 057
2001	9400	28 526	6991	1096	46 013
Change; number (%)	778 (9)	5786 (25)	1254 (22)	138 (14)	7596 (21)
<i>Over 45 years</i>					
2000	5329	15 827	6220	281	27 657
2001	6583	19 963	6847	306	33 699
Change; number (%)	1254 (24)	4136 (26)	627 (10)	25 (9)	6042 (22)

Table 5 Results of the current smear (weeks 14–32) (*n* = 145 426)

	2000; number (%)	2001; number (%)
Inadequate, negative, mild dyskariosis or borderline smears	64 976 (99)	78 909 (99)
Moderate, severe, severe/invasive, glandular neoplasia	738 (1)	803 (1)
Total	65 714	79 712

Table 6 Screening interval for women with previously abnormal smears (weeks 14–32) (*n* = 22 325)

	2000	2001	Change; number (%)
'Returning on time'	8639	10 377	1738 (20)
'Returning late'	1459	1850	391 (27)
Total	10 098	12 227	2129 (21)

the majority of women under the age of 25 are having their first smear and the largest increase occurred in this group (from 3711 in 2000 to 4729 in 2001: an increase of 27 per cent; 95 per cent CI 26–29 per cent).

Discussion

This study demonstrates a substantial increase in the number of cervical smears being performed in the weeks following the soap opera story line. The story line had not been planned by health professionals to deliver a health message. Although multiple factors influence attendance for cervical screening,¹⁵ we can identify no other local cause over the time period to explain the increase and conclude that it was attributable to the television story. However, the story generated considerable media attention at the time, with both news and magazine coverage, and we are not able to separate out these effects. Nationally, the publi-

cation of the Leicestershire audit on cervical screening occurred during our study period (May 2001),¹⁶ and professional opinion at the time was, again, that this would decrease the number of women attending for screening.¹⁷

The increase was larger in Greater Manchester Health Authorities than in Lancashire. We are currently investigating the correlation between television viewing figures and the number of smears performed nationally.

The results are in line with the significant changes in health service utilization identified in a recent systematic review of mass media interventions,⁷ although the three studies evaluating unplanned media coverage in the review all relate to factual 'news' stories.^{18–20} The duration of the effect in this study contrasts with a short-term effect found in a United Kingdom study designed to evaluate the impact of a drug overdose in a television drama, although that story line lasted just one episode.⁸

The overall increase in cervical smears in this study (21 per cent) is similar to that recorded in a previous Australian study (30 per cent), where a 30 second television commercial was used in combination with other media interventions to increase attendance.²¹ One other study using promotional television recorded no change in being up-to-date with breast or cervical screening.²²

The increase in the number of smears occurred in all categories of screening interval. The number of 'unscheduled smears', even in the baseline year, is of concern because these do not conform with programme guidelines and confer no overall health benefit. It is anticipated that there are two possible consequences of the increase in those attending 'on-time'; i.e. a decrease in the number of smears being done over the following 6 months and/or a 'surge' in the number of smears being performed in 3 and 5 years time at the time of routine recall. We have planned further research to examine this trend, and it will be interesting to see the impact on national coverage statistics.

The increase in smears performed compared with the previous year in women 'overdue' smears (1881), who had never previously had a smear (163), or who had had previously abnormal smears but had delayed returning for a repeat smear (391), represent positive impacts of the story line upon the screening programme (a total of 2435 women). This is a small proportion

(0.25 per cent) of the population eligible for screening in the North West. The increase in smears detecting 'potentially significant abnormalities' (65) represents a potential health benefit of the story line to the individual.

The costs of cervical screening are notoriously difficult to calculate. The most recent economic evaluation of the cervical screening programme estimates the cost in the United Kingdom at £34 per woman screened.⁴ Using this estimate suggests that the extra 13 998 smears performed in women over 25 on routine recall in the period following the story line cost approximately £470 000 in the North West. The impact on operational services was considerable, requiring extra staff and staff being drafted in at weekends to minimize reporting times for smear results. Considering that there were just an extra 2435 smears performed in women 'overdue', who had 'no previous smear' or who had 'returned late' following a previously abnormal smear, the overall cost benefit resulting from the story line has to be questioned. The complexity of modelling from abnormal smear results precludes calculations of 'life years gained' and we are unable to say whether the story line will have any impact on survival. Given the concern about reduced uptake in women aged 20–24,²³ the increase in women attending for their first smear was encouraging.

It is of note that whereas there was professional concern that the number of smears performed would decrease following the story line, in fact the opposite occurred. This contrasts with the recent review of mass media interventions that found that the direction of effect on health service utilization was consistent across the studies towards the expected change.⁷ This emphasizes the difficulty of predicting the direction of changes in behaviour following health-related stories in entertainment television. Although the ability for this type of entertainment to increase knowledge about health-related issues has been shown previously, the evidence that this knowledge is successfully translated into behaviour change is less complete.^{24,25} We have clearly demonstrated a large change in behaviour following a soap opera story line. Our results suggest that fictional television health stories may offer opportunities for health promotion although the difficulty of actually embedding health stories in entertainment television in the United States has been noted.²⁶

Should behaviour change, which may bring little benefit to population health but may lead to consumption of scarce resources, bring with it an ethical responsibility for programme makers?

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Contributors

A.H., V.O.S. and J.R. designed the study; A.H. and V.O.S. performed the data analysis; and A.H., V.O.S. and J.R. jointly wrote the manuscript. A.H. is the guarantor for this study.

Competing interests

J.R. provides occasional medical advice to *Coronation Street*.

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