

Smoking Cessation in Hospitals

Return on Investment

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| 1. Introduction

Smokers are at elevated risk of emergency admission to hospital. Local intelligence has highlighted that smokers admitted to hospital can be receptive to the idea of quitting, even quitting spontaneously for a period, whilst they are in hospital. It has been suggested that acute trusts consider placing a dedicated stop smoking advisor within hospitals to support smokers who would like to quit. This will then pay dividends in terms of future reductions in emergency admissions.

The NHS Institute for Innovation and Improvement have produced a Return on Investment tool. The tool allows local practitioners to produce estimates of the likely return on investment of smoking cessation activity amongst patients who are admitted to hospital as emergencies¹. This tool has been used to produce provider-level estimates of the likely return on investment for the seven main hospitals in Kent and Medway; namely Darent Valley Hospital, Maidstone Hospital, Pembury Hospital, Kent & Canterbury Hospital, Queen Elizabeth the Queen Mother Hospital, William Harvey Hospital and Medway Maritime Hospital.

| 2. Assumptions

The return on investment tool requires the input of a series of measures, which then form the assumptions for the modelled dividend figures. Where possible, the figures input relate to the 2014/15 financial year.

2.1 Emergency Admissions, Bed Days & Costs

The tool requires the input of the total number of patients admitted to each hospital as an emergency, the annual number of bed days accrued by these patients and the cost per day. This data has been sourced as follows:

2.1.1. Total Emergency Admissions

The total number of emergency admissions to the seven main Kent and Medway hospitals has been sourced from the Secondary User Service (SUS), for contract year 2014/15². Data has been drawn from the PBR tables, so that tariff information could be extracted. Only those aged 18 or over on the date of admission have been included. This gives a figure of 139,247 for the total number of emergency admissions (aged 18+) to these hospitals during 2014/15³.

¹ The tool also includes a facility to calculate the return on investment of smoking cessation activity amongst staff. This feature has not been utilised for this particular project.

² This work has been conducted in collaboration with Medway Public Health Observatory, to allow the inclusion of emergency admissions to Medway Maritime Hospital.

³ Please note that 'local patient ID' has been used to identify individuals and as such it has only been possible to group together emergency admissions to the same hospital over the year.

2.1.2 Bed Days

Further analysis of the SUS PBR dataset reveals that these 139,247 patients stayed in hospital a total of 713,021 days⁴.

2.1.2 Costs

The model requires input of the cost per bed day for each provider. This has been calculated from the payment information contained within the PBR SUS tables⁵. The total tariff paid for each individuals' emergency admissions across the year have been divided by the total number of days they stayed in hospital (in relation to these admissions).

2.2 Smoking Prevalence

The tool also requires the input of the proportion of the identified admissions who are an admitted smoker. This has been estimated using 2014 data from the Local Tobacco Control Profiles and previous research on smoking amongst emergency hospital admissions as follows:

- Step 1: Local Tobacco Control Profiles⁶ used to source estimates for admitted smoking prevalence in the overall adult populations in Kent and Medway
 - Kent: 19.1% for 2014, with a 95% confidence interval of (17.5%,20.6%)
 - Medway: 22.7% for 2014, with a 95% confidence interval of (20.6%, 24.8%).
- Step 2: Existing research⁷ used to source an estimate of the extent to which individuals admitted to hospital as an emergency are more likely to be smokers than average (odds ratio of 1.8, with a 95% confidence interval of (1.65,1.96)).
- Step 3: Smoking prevalence estimates for Kent and Medway calculated as 34.3% and 40.9% respectively. If both confidence intervals are applied, this suggests an admitted smoking prevalence of between 28.9% and 40.4% for emergency admissions in Kent and between 34.0% and 48.7% for emergency admissions in Medway.

The Kent estimate has been used across all six Kent hospitals, and the Medway estimate for Medway Maritime.

⁴ Derived from the 'length of stay' PBR field.

⁵ Derived from the 'tariff total payment national' PBR field. As such costs have the Market Forces Factor (MFF) applied.

⁶ <http://www.tobaccoprofiles.info/>. Data on smoking prevalence is sourced from the Integrated Household Survey (% of persons aged 18+ who are self-reported smokers).

⁷ L Szatkowski, R Murray, R Hubbard, S Agrawal, Y Huang, J Britton. Prevalence of smoking among patients treated in NHS hospitals in England in 2010/2011: a national audit. *Thorax*. 10.1136/thoraxjnl-2014-20628. (<http://thorax.bmj.com/content/early/2014/10/14/thoraxjnl-2014-206285.abstract>). This research using linked datasets demonstrated that patients aged 15+ admitted to hospital via A&E were 1.8 times more likely to be smokers than the average population. Patients admitted via A&E have been taken as a proxy for emergency admissions.

2.3 Quit Rates

Finally, the tool requires the input of the proportion of the smoking population who attempt to quit and the proportion of attempts to quit who were successful. This has also been estimated using 2014 data from the Local Tobacco Control Profiles as follows:

- Local Tobacco Control Profiles⁸ used to source an estimate of the rate of smokers aged 16+ in Kent and Medway in 2014/15 setting a quit date
 - Kent: 3,559 per 100,000, with a 95% confidence interval of (3,483, 3,637)
 - Medway: 6,337 per 100,000, with a 95% confidence interval of (6,113, 6,567)
- This is then simply converted into a percentage for use in the tool (i.e. to 3.6%, with a 95% confidence interval of (3.5%,3.6%) for Kent and 6.3%, with a 95% confidence interval of (6.1%,6.6%) for Medway).
- Local Tobacco Control Profiles also used to source an estimate of the rate of self-reported successful quitters at 4 weeks in Kent and Medway in 2014/15
 - Kent: 1,921 per 100,000, with a 95% confidence interval of (1,865, 1,978)
 - Medway: 3015 per 100,000, with a 95% confidence interval of (2,861, 3,175)
- This is then converted into a percentage using the rate of smokers setting a quit date (54.0% for Kent and 47.6% for Medway). Taking the confidence limits of both the numerator and denominator into account suggests that the true value for Kent lies somewhere between 51.3% and 56.8%, and for Medway between 43.6% and 51.9%.

The Kent estimates have been used across all six Kent hospitals, and the Medway estimates for Medway Maritime.

2.4 Other Assumptions

The tool has been utilised based on the assumption that any new smoking cessation activity would be a block contract based service, at a cost of £30,000 per hospital. This is based on the cost of placing a single stop smoking advisor in each hospital, and assumes that a similar level of resource is deployed in each of the seven sites.

It has been assumed that the dividend remains the same each year, which in effect means that backsliders (i.e. those who resume smoking) are balanced by new quitters and that the full benefit is felt in Year 1.

⁸ <http://www.tobaccoprofiles.info/>.

3. Return on Investment

The above assumptions have been used in conjunction with the NHS Institute for Innovation and Improvement Return on Investment tool, to produce the following return on investment estimates for each of the seven main hospitals in Kent and Medway. These calculations are based on a block contract cost of £30,000 per hospital.

This suggests an annual dividend of around £1.9 million.

The table below includes a degree of sensitivity analysis, conducted by taking into account the confidence intervals associated with each of the inputs to the model. The figures shown represent the lowest and highest possible values that would be produced by the tool if all of the true values were at the extremes of their individual confidence intervals.

Hospital	Return on Investment ⁹	Sensitivity Analysis	
		Lower Bound	Upper Bound
Darent Valley	£237,000	£179,000	£308,000
William Harvey	£262,000	£198,000	£339,000
QEQM	£209,000	£157,000	£272,000
Kent & Canterbury	£167,000	£124,000	£219,000
Maidstone	£153,000	£113,000	£201,000
Pembury	£217,000	£163,000	£282,000
Medway	£622,000	£449,000	£848,000
Total	£1,867,000	£1,383,000	£2,469,000

4. Conclusions

This analysis suggests a clear return on investment for smoking cessation activity in hospital. The NHS Institute for Innovation and Improvement Return on Investment tool suggests an annual return on investment of around £1.9 million across the seven main hospitals in Kent and Medway.

⁹ To nearest £1,000.