

**Modelling the economic impact  
of tobacco control measures  
in the West Midlands**

*Final Report to Directorate of Health  
(West Midlands Public Health Group)*

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# Summary

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## Introduction (See Chapter 1)

1. In 2003, the Department of Health (West Midlands Public Health Group) (WMPHG) commissioned research which aimed to:
  - Create an economic model to establish, at least in outline, the impact of tobacco production, retail distribution and consumption on the West Midlands economy.
  - Assess what the likely economic impact/consequences would be of a reduction in the number of West Midlands people who use tobacco products.

## Policy (See Chapter 2)

2. In the 1998 White Paper, *Smoking Kills*, the Government set out its plan to reduce the overall rate of smoking among adults in all social classes to 24% by 2010, reduce smoking among children (11-15) to 9% by 2010 and improve the health of expectant mothers and their families by reducing smoking among pregnant women from 23% to 15% by 2010.
3. The White Paper also announced the setting up of NHS Smoking Cessation Services. This was further described in the National Service Framework for Coronary Heart Disease. These Smoking Cessation services are located around the country and are designed to offer a local option to those trying to quit smoking. They allow those using the service to receive face-to-face help from a specialist, either on an individual basis or as part of a group. While some services are delivered through GPs and their staff, these services enable GPs to act more often as signposts, without having to be the main resource, thereby reducing the burden on what are already busy schedules.
4. The NHS Cancer Plan 2000 developed some of the ideas in the White Paper and specifically introduced a target to reduce smoking among manual workers from 32% in 1998 to 26% by 2010.

## Key statistics (See Chapter 3)

5. There are around 1.1m smokers in the West Midlands region who spend an estimated total of £1.3bn on tobacco products every year. Among the smoking population, prevalence rates and/or the total number of smokers are particularly high for certain groups:
  - In terms of gender, **men** are more likely to smoke (and more likely to quit) than women.

- People aged **20-34 years** have the highest smoking rates of all age groups.
- **Young women aged 16-19** and **men aged 20-34** have the highest rates of smoking among all age and gender groups.
- The highest absolute number of smokers in the West Midlands is in the **35-49 year** age bracket for both men and women. Smokers are more likely to start quitting in this age group.
- Those in **routine and manual occupations** have the highest rates of smoking among the working population.
- Those who are **economically inactive** have higher smoking rates in every socio-economic class compared with their economically active counterparts.
- Households in the West Midlands who fall within the **lowest income decile** (income lower than £114 per week) spend the highest proportion of their disposable income on tobacco.
- 20% of boys and 26% of girls **aged 15** are regular smokers. Prevalence rates increase sharply from children aged 13 (6%) to those aged 14 (16%).

#### **Health (See Chapter 4)**

6. In the West Midlands in 2001, almost 63,800 smokers required hospital treatment for a total of nearly 473,000 bed days at a cost of £189m. The cost of providing outpatient and follow-up appointments for smokers with smoking-related diseases in the region is estimated to be £15m.
7. Over 12,100 smokers died because of their habit, losing a cumulative total of over 60,000 life years. Premature deaths from smoking cost the West Midlands economy £138m in 2001.
8. Second hand smoke costs the West Midlands economy a total of £2.7m every year.

#### **Business (See Chapter 5)**

9. Smoking results in over 3m days off work a year for the West Midlands workforce. £196m of working time is lost to businesses in the region due to the ill health caused by smoking.
10. Smoking among the West Midlands workforce costs businesses £668m in equivalent wages every year due to lost productivity caused by smoking-related ill health and cigarette breaks taken during work time.

**Employment (See Chapter 6)**

11. Less than 0.2% of the region's workforce depends on the manufacture, wholesale, retail and spending on tobacco products in the West Midlands.
12. A 40% reduction in tobacco consumption would yield 11,000 new jobs in the regional economy and £203m in additional wages.

**Fire (See Chapter 7)**

13. In 2000, it is estimated that 925 fires had a source ignition attributed to smokers' materials. These fires resulted in 19 deaths and 167 injuries.
14. The economic cost of fires whose source ignition is smokers' materials is estimated to be over £24m.

**Attitudes (See Chapter 8)**

15. There is strong support in the West Midlands for a *ban* on smoking in most public places. Around half of the region's population support a ban in colleges, universities and the workplace, but less than a quarter would like to see a ban on smoking implemented in public houses. More than half (54%), however, agree that smoking should be *restricted* in pubs.

**Conclusions (See Chapter 9)**

16. Smoking costs the West Midlands economy over £1.25bn every year.
17. Around 69% of this cost is borne by businesses within the region.
18. A one percentage point reduction in smokers (from 27% to 26%) in the West Midlands would yield a net saving of £64.6m per annum for the regional economy – equivalent to £1,500 per smoker who quits.
19. The net gain to the local economy in producing a long-term quitter through the most intensive, expensive level of NHS support and NRT available is a minimum of £800 in the year during which support and NRT are provided.

**Recommendations (See Chapter 10)**

20. The WMPHG and partners should aim to improve the range and quality of data attached to hospital episode statistics and procured through the West Midlands Lifestyle Survey.

21. The WMPHG and partners should design an anti-smoking policy targeted at demographic groups with the highest smoking rates and – most importantly – at businesses in the region, who should be persuaded to adopt a ‘no smoking’ policy in the workplace by promoting the clear financial advantages of implementing such action.
22. It is in the workplace that the WMPHG and partners should aim to be the flag bearers. The health sector directly employs around 7% of the region’s workforce (around 150,000 staff), and while smoking rates may be lower among these employees compared with other sectors, the NHS should implement a ‘no smoking’ policy that covers its own staff and visitors and that is enforced both within buildings and on grounds that are owned, run and managed by the health service.
23. If the public sector is serious about calling for a ban on smoking in public places, it should be seen to be the champion of such a cause and lead by example. The economic impacts are clear.
24. Finally, the findings from this initial study need to be shared and discussed much more widely, both within the health service and elsewhere. In addition, the early modelling work that has begun here needs to be built upon and improved, not least by creating more reliable primary data sources upon which to base estimates of the economic impacts of tobacco control measures.

# 1. Introduction

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- 1.1 In 2003, the Department of Health (West Midlands Public Health Group) (WMPHG) commissioned UK Research Partnership Ltd and The Mackinnon Partnership to undertake an economic modelling exercise to predict the likely and possible impacts of introducing tobacco control measures in the West Midlands. This is the final report of our research.
- 1.2 The main aims of the research were:
- To create an economic model to establish, at least in outline, the impact of tobacco production, retail distribution and consumption on the West Midlands economy.
  - To assess what the likely economic impact/consequences would be of a reduction in the number of West Midlands people who use tobacco products<sup>1</sup>.
- 1.3 After discussion with the project steering group, the research sought to evaluate the impact of the tobacco economy and the consequent effects of a reduction in the number of people who use tobacco products in several key areas. These areas of interest, together with the assumptions and reasoning underpinning each measure, are shown in Table 1 overleaf.
- 1.4 It should be noted, that for the purposes of this research, the methodology has disregarded the impact of reductions in smoking on tax revenues from the sale of tobacco products to West Midlands residents. Any consequent losses in Treasury revenues and subsequent decrease in monies returning to the West Midlands from central Government have also been discounted.
- 1.5 This report examines the nature of the tobacco economy in each of the key areas and illustrates the economic impact of a reduction in smoking in each case. The report concludes with an overall economic assessment of the net impact of a reduction in smoking across the region, and makes recommendations as to how the WMPHG and partners can best use their resources to maximise the effectiveness of smoking reduction and intervention strategies.
- 1.6 Before the analysis is described, the report begins with a summary of the current policy context within which smoking intervention strategies are operating.

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<sup>1</sup> While this report focuses mainly on cigarettes, cigars and hand-rolling tobacco products, it is recognised that there are other forms of tobacco not covered in this work (such as Paan – chewing tobacco used mainly by people from the Asian sub-continent). The economic costs of tobacco calculated in this report have not taken the impact of such products into account.

Table 1 Modelling framework

Impact	Measures	Reasoning and assumptions
<b>Key statistics</b>	<b>Demographics:</b> <ul style="list-style-type: none"> <li>Smoking prevalence by age, gender and socio-economic status.</li> </ul> <b>Expenditure:</b> <ul style="list-style-type: none"> <li>Value of tobacco consumption in the regional economy and shifts in purchasing power to other goods and services as people stop smoking.</li> <li>Indirect effect of income generated and spent by those supplying and selling tobacco in the West Midlands. This must take into account illegal sales as well as purchases made through conventional outlets.</li> </ul>	<ul style="list-style-type: none"> <li>Different groups have different take-up rates of smoking and a programme targeted at different groups will produce different economic impacts.</li> </ul>
<b>Health</b>	<ul style="list-style-type: none"> <li>Cost of treating patients suffering from smoking-induced illnesses.</li> <li>Opportunity cost of a reduction in patients requiring treatment due to smoking.</li> <li>Reduced burden on family members and the care industry to look after people becoming ill and dying prematurely due to smoking.</li> <li>Additions to pension funds and to pensioner spending power through longer working life and greater life expectancy.</li> <li>Consequences to the region of a larger number of people living to a greater age.</li> </ul>	<ul style="list-style-type: none"> <li>Though the burden of treating smokers lies heavy on the health service, it will continue to operate to full capacity regardless of a reduction in one type of patient or disease. There will likely be a shift in the types of patients being seen and the type of treatments received, as well as the knock-on effects on NHS waiting lists and the consequent speeding-up in return to work for other patient types.</li> <li>Life expectancy is assumed to be 75 for men and 80 for women (Cambridge Group for the History of Population and Social Structure).</li> </ul>
<b>Business</b>	<ul style="list-style-type: none"> <li>Reduced number of sick days taken by the regional workforce.</li> <li>The cost of employees may be greater in SMEs where there is less opportunity for absenteeism to be absorbed by a firm with a smaller workforce.</li> <li>Cost in lost productivity of staff taking cigarette breaks during work time.</li> </ul>	<ul style="list-style-type: none"> <li>Productivity will likely be increased by a fitter, healthier workforce taking less time off work.</li> </ul>
<b>Employment</b>	<ul style="list-style-type: none"> <li>Change in numbers working in retail, wholesale, distribution, advertising and marketing jobs reliant on tobacco production and consumption.</li> <li>Likely displacement of labour to other industries from tobacco-dependent sectors.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in retail employment due to more cessation products and higher sales likely to be negligible as new product ranges will be absorbed within existing premises and staff structures.</li> <li>Ex-smokers will shift spend from tobacco to (mainly) goods and leisure services.</li> </ul>
<b>Fire</b>	<ul style="list-style-type: none"> <li>Cost of fires whose source of ignition is defined as smokers' materials in terms of death, injury, property, business, repair and fire service.</li> </ul>	<ul style="list-style-type: none"> <li>No chimney fires or secondary fires have smokers' materials as source of ignition.</li> </ul>
<b>Attitudes</b>	<ul style="list-style-type: none"> <li>Support for either bans or restrictions on smoking in a range of public places.</li> </ul>	<ul style="list-style-type: none"> <li>Assumes uniform opinion across some different demographic groups.</li> </ul>

## **2. Policy and operating context**

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- 2.1 In order to develop a practical strategy to reduce the number of smokers in the West Midlands, and to target such strategies at certain groups of the population (based on the demographic profile of smokers and the costs involved in their ill health and treatment), it is first necessary to understand current policy aimed at reducing the number of people who use tobacco.
- 2.2 This section outlines the Government's targets on tackling the smoking population and the range and nature of services and products aimed at helping to achieve those ambitions.

### **National policy**

- 2.3 The Government set clear targets on smoking cessation in the 1998 White Paper *Smoking Kills*. Three areas of action were identified and the following targets were set:
- To halt the rise in child smoking.
    - Reducing smoking among children (11-15) from 13% to 9% by 2010 (an interim target of 11% is set for 2005).
  - To establish a new downward trend in adult smoking in all social classes.
    - Reducing the overall rate among adults (over 16) from 28% to 24% by 2010 (an interim target of 26% is set for 2005).
  - To improve the health of expectant mothers and their families.
    - Reducing smoking among pregnant women from 23% to 15% by 2010 (an interim target of 18% is set for 2005).
- 2.4 The NHS Cancer Plan 2000 developed some of the ideas in the White Paper and specifically introduced a target to reduce smoking among manual workers from 32% in 1998 to 26% by 2010.

## **Cessation services and products**

- 2.5 The White Paper also announced the setting up of a NHS Smoking Cessation Service. This was further described in the National Service Framework for Coronary Heart Disease. These Smoking Cessation services are located around the country and are designed to offer a local option to those trying to quit smoking. They allow those using the service to receive face-to-face help from a specialist, either on an individual basis or as part of a group. While some services are delivered through GPs and their staff, these services enable GPs to act more often as signposts, without having to be the main resource, thereby reducing the burden on what are already busy schedules.
- 2.6 The service provides counselling and support to smokers trying to quit and NRT treatments and Bupropion (Zyban), which are both now available on prescription. (The National Institute for Clinical Excellence (NICE) has given guidelines for their use.) The first prescriptions of NRT or Zyban should only be enough to last until 2 weeks after the target stop date, and further prescriptions will follow if the user is still actively trying to quit.
- 2.7 NRT works by giving the user nicotine in other ways (patch, gum, lozenge, inhalators, nasal spray) at a lower level than smoking and by reducing the urges to smoke and the physical addiction to nicotine over a period of time (normally three months). They are available to smokers aged over 18 years of age, and those under 18 years on the recommendation of a healthcare professional. A wide variety of NRT products from various companies is available in the UK.
- 2.8 The Health Development Agency has also established training guidelines for NHS Smoking Cessation workers. These cover information about cessation treatments, the ability to assess a client's needs and a general knowledge of the pharmacology of smoking. The Cessation Services have received £76m (nationally) over the four-year period 1999/2000 to 2002/2003. This allocation includes provision for a Smoking in Pregnancy initiative.
- 2.9 The Smoking in Pregnancy initiative provides for the appointment of 'local champions' or specialists to co-ordinate/offer services specifically tailored to the needs of pregnant women. They are responsible for a variety of actions, including providing a skilled intervention at an early stage, support clinics and home visits. They will also assist in co-ordinating joint working with Sure Start, in their work on the health of children.

- 2.10 The charity QUIT runs its own telephone helpline and a website providing resources and advice for those who wish to give up smoking. Like the NHS lines, this includes a service for ethnic minorities who would like to speak to someone in a language other than English who may understand more of their specific cultural issues concerning smoking.
- 2.11 An NHS telephone helpline for those wishing to quit has also been set up. It is open between 7am and 11pm every day and is free to call. Operators can send callers an information pack or put them through to a specialist advisor. This service is complemented by a website ([www.givingupsmoking.co.uk](http://www.givingupsmoking.co.uk)) which contains a range of material. The site offers a service to find the nearest Smoking Cessation Service via a postcode finder. Alternatively, there is now an entry in the Yellow Pages for 'Stop Smoking Services'. The Government believes that nearly 124,000 smokers managed to quit using the full range of NHS support services in 2002/2003.
- 2.12 Other measures outside the NHS are intended to help meet the cessation targets. The Health and Safety at Work Act 1974 covers smoking at work since the Government's scientific advisory committee has stated that second hand smoke causes cancer and increases the risk of other illness caused by smoking in non-smokers. The Health and Safety Commission published a draft Approved Code of Practice in 1999 and a revised Code in October 2000. The Commission has also published advice on tackling the effects of second hand smoke at work, recommending that all employers should introduce a policy to control smoking in the workplace (following consultation with all employees) in order to achieve improved corporate image, staff morale staff retention and productivity rates.
- 2.13 The UK Government supports a total ban on tobacco advertising and The Tobacco Advertising and Promotion Act 2002 received Royal Assent on 7 November 2002. This is at least partially motivated by the link perceived between smoking among children and advertising, following evidence that 96% of children had seen a tobacco advertisement. A total ban is to be in place by the end of July 2006.

- 2.14 The EU Directive 2003/33/EC of May 2003 supports these measures by ensuring that tobacco-related advertising and sponsorship is judged against a common framework across all EU member states in order to try and close loopholes in promoting tobacco products which may arise through differences in individual member states' laws. The directive focuses on approximating laws to provide common definitions covering tobacco-related advertising, sponsorship and free distribution of product, particularly through mediums such as 'information society services' (such as the internet) which operate across borders and which are particularly attractive and accessible to young people.
- 2.15 In addition, QUIT (and many others) run courses for health professionals on smoking cessation. These range from half a day to a more intensive two or three day course. They also offer a range of information and advice to employers who are thinking about implementing a smoking policy, and provide 'stop smoking' courses for employees. These can range from display days to intensive courses.
- 2.16 Alternative therapies are also available, primarily Hypnotherapy and Acupuncture, although they are not funded through the NHS as generally their effectiveness in helping people to quit smoking is not evidence-based or measured in the same way as NHS products and services. There are various Hypnotherapy clinics offering sessions to help those who want to quit smoking. This can either involve attending a session at a clinic or buying a recording, which can be listened to at home, or while sleeping. The Government, while recognising people should have a choice regarding the treatment route they choose when trying to quit, recommend ensuring that any alternative practitioner is a member of a recognised professional body.

### 3. Key statistics

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3.1 In this section, we outline the key demographic statistics covering both the overall and smoking populations within the region, which form the basis of our modelling and analysis in the following chapters. Comparisons are made with other regional and national trends, and targets and expenditure on tobacco by smokers in the West Midlands are also detailed.

#### Prevalence

3.2 Over the last fifty years, the proportion of people who smoke in the UK has fallen substantially. In 1948, more than half (52%) of the people in Great Britain smoked, but by 1980, the proportion had fallen to 39% (UK). By 1990, only 29% of the adult population aged 16 and over were smokers. Since then, however, the UK has experienced a slow-down in the rate of decline in smoking, with the rate falling by just two percentage points over the last 11 years and no change in the overall prevalence rate from 1998 to 2001.

3.3 Table 2 below shows that prevalence rates among different age groups have followed broadly the same pattern over the last decade. The proportion of the population who smoke peaks in the 20-24 year old age group and then declines steadily to roughly 60% of the average rate among those aged 60 and above.

**Table 2 Prevalence of smoking among UK 16+ population by age (percent)**

Year	All	16-19	20-24	25-34	35-49	50-59	60+
1980	39	33	42	45	43	44	28
1982	35	31	39	38	38	40	27
1984	33	30	37	37	36	39	25
1986	32	31	40	36	35	34	25
1988	31	28	37	35	35	33	23
1990	29	31	39	35	33	27	21
1992	28	26	38	34	29	27	19
1994	26	28	40	32	29	26	16
1996	28	29	39	35	30	27	18
1998	27	31	41	34	30	26	15
2000	27	30	36	35	29	26	16
2001	27	28	37	34	29	25	16

Source: General Household Survey

Note: 1980-1998 data are unweighted, 2000-2001 data are weighted

- 3.4 There are also noticeable differences in smoking rates among men and women. Table 3 shows that, while a higher percentage of adult men smoke than their female counterparts, prevalence rates are higher for women in the 16-19 year age group. The single highest prevalence rate is among 20-24 year old men, while rates are also high among 25-34 year old males.

**Table 3 Prevalence of smoking among UK 16+ population by age and gender (percent)**

Gender	All	16-19	20-24	25-34	35-49	50-59	60+
Men	28	24	39	38	31	25	16
Women	25	31	35	30	27	24	17

Source: General Household Survey

- 3.5 While the majority of smokers (77%) smoke filter cigarettes, men are far more likely to use hand-rolling tobacco (32%) than women (11%). The proportion of both men and women who use hand-rolling tobacco has risen sharply over the last decade: in 1990, 18% of men and just two percent of women rolled their own cigarettes.
- 3.6 Men are also likely to be heavier smokers than women. Of the 28% of adult men across the UK who smoke, one third are heavy smokers (defined as 20 or more per day). Of the 25% of women who smoke, 27% are heavy smokers.
- 3.7 If prevalence rates according to age and gender are applied to the West Midlands population as a whole, the total number of smokers in the region can be calculated, as shown in Table 4 below.<sup>2</sup>

**Table 4 Numbers of smokers in the West Midlands by age and gender**

Age	Male	Female	All
16-19	33,501	40,628	74,552
20-24	60,026	54,084	114,128
25-34	136,720	110,611	246,833
35-49	170,290	149,382	319,236
50-59	84,719	81,649	166,229
60+	76,835	103,290	180,007
<b>Total</b>	<b>565,010</b>	<b>542,066</b>	<b>1,106,159</b>

Source: General Household Survey; Population Census 2001

- 3.8 It is estimated that over 1.1m people aged over 16 years who live in the West Midlands are smokers, 51% of whom are men.**

<sup>2</sup> This study uses the national smoking prevalence rate of 27% for the West Midlands region. However, it should be noted that the General Household Survey (and recent Smoking Cessation Bulletins which have emerged during the course of this work), indicate that the West Midlands prevalence rate is estimated to be around 24%.

- 3.9 There are sharp differences in smoking rates according to occupation and socio-economic status. On average, 32% of those in manual socio-economic groups smoke and rates are slightly higher in this category for men (34%) compared with women (31%).
- 3.10 Table 5 shows that the more unskilled the occupation, the higher the proportion of men and women who smoke. Prevalence rates vary from 15% of men and women employed in higher managerial positions in large companies to more than double that rate among male routine manual workers (36%). Those in lower skilled socio-economic status groups are also likely to smoke more cigarettes per day than their counterparts in managerial and professional occupations.

**Table 5 Prevalence of smoking among UK 16+ population by socio-economic status**

	Persons		Men		Women	
	Rate %	No.	Rate %	No.	Rate %	No.
<b>Managerial and professional</b>	<b>19</b>	<b>12</b>	<b>21</b>	<b>13</b>	<b>17</b>	<b>11</b>
Large employers & higher managerial	15		15		15	
Higher professional	15		17		12	
Lower managerial & professional	22		24		20	
<b>Intermediate</b>	<b>27</b>	<b>13</b>	<b>29</b>	<b>15</b>	<b>26</b>	<b>12</b>
Intermediate	27		28		27	
Small employers & own account workers	28		30		26	
<b>Routine and manual</b>	<b>32</b>	<b>15</b>	<b>34</b>	<b>16</b>	<b>31</b>	<b>14</b>
Supervisory & technical	30		33		27	
Semi-routine	33		33		32	
Routine	34		36		33	
<b>Average</b>	<b>27</b>	<b>14</b>	<b>28</b>	<b>15</b>	<b>25</b>	<b>13</b>

Source: General Household Survey

- 3.11 It should be noted, however, that the highest prevalence rates occur in economically inactive groups. Those who are economically inactive within each socio-economic group (i.e. those who are seeking work or who have last worked in a particular group) have higher rates of smoking than their economically active counterparts. Among economically inactive groups, prevalence rates are again highest in the lowest socio-economic categories.
- 3.12 At the highest end of the scale, over half (55%) of economically inactive men in routine and manual categories aged 16-59 are smokers, as are 45% of economically inactive women in this group.

- 3.13 Those in routine and manual categories are also more likely to smoke hand-rolled cigarettes (25%) than people working in managerial and professional occupations (14%). Over a third (37%) of men in routine and manual socio-economic groups use hand-rolling tobacco. They are also more likely to start smoking at a younger age.

### **Expenditure**

- 3.14 Since 1997, the price of tobacco has risen by a factor of 1.4, while comparatively, household disposable income has risen by a factor of only 1.1. From 1997 to 2002, tobacco has become almost 9% less affordable in real terms.
- 3.15 Despite these ratios, a substantial sum is spent on tobacco in the UK. In 2002, £14.9bn was spent on tobacco products (including 56bn cigarettes, 2.8 tonnes of hand-rolling tobacco, 535 tonnes of pipe tobacco and 872m cigars). This compares with £12.6bn in 1997 (all at current prices).
- 3.16 Based on the proportion of smokers in the UK who live in the West Midlands, it is estimated that smokers in the region spend £1.3bn on tobacco products every year. On average, a smoker spends around £22.75 a week on tobacco (nearly £1,200 a year).**
- 3.17 The Expenditure and Food Survey (EFS) (2001-02), gives the average amount of expenditure on tobacco products for each income decile for households in the UK. Unfortunately, this data is aggregated for all households and it is not possible to obtain the amount spent by each individual adult smoker, or the amount of money spent on tobacco products by households where there is at least one smoker.
- 3.18 In addition, it is recognised that there is significant 'under-reporting' of expenditure on tobacco (and other goods such as alcohol and lottery tickets) in the EFS. Comparing EFS data to HM Customs and Excise and General Household Survey information, it is estimated that average expenditure on tobacco given in the EFS is around 50% of actual expenditure. This is thought to be due mainly to understatement and non-response by very heavy smokers.<sup>3</sup>
- 3.19 However, by weighting the average amount spent on tobacco in a week in all households (as given by the EFS), by the average amount spent by a smoker in a week, it is possible to estimate tobacco expenditure for each income decile group.

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<sup>3</sup> FES Handbook, Kemsley, Redpath and Holmes

3.20 Based on this methodology, Table 6 below shows that those in the lowest income, proportionally, spend far more on tobacco than their counterparts in high earning groups.

3.21 **In the lowest income group, an average smoker could consume over a fifth of the total household expenditure on tobacco alone.**

**Table 6 Estimated weekly expenditure on tobacco by average single smoker and total household weekly expenditure by income group, UK 2003**

Income decile group	Expenditure on tobacco (£, per smoker)	Total expenditure (£, per household)	%	Commodity/ Service expenditure (£, per household)*	%	Average no. of adults per household
Lowest 10%	26.13	128.00	20.4	118.20	22.1	1.1
2 <sup>nd</sup>	24.98	171.30	14.6	155.80	16.0	1.3
3 <sup>rd</sup>	19.46	217.40	9.0	194.20	10.0	1.6
4 <sup>th</sup>	23.58	279.40	8.4	246.10	9.6	1.7
5 <sup>th</sup>	25.34	322.00	7.9	279.30	9.1	1.8
6 <sup>th</sup>	27.09	389.00	7.0	332.20	8.2	1.9
7 <sup>th</sup>	25.32	449.40	5.6	383.20	6.6	2.0
8 <sup>th</sup>	24.59	529.80	4.6	447.70	5.5	2.1
9 <sup>th</sup>	19.22	608.20	3.2	508.80	3.8	2.3
Highest 10%	15.57	888.40	1.8	722.80	2.2	2.3
<b>All</b>	<b>22.75</b>	<b>398.30</b>	<b>5.7</b>	<b>338.80</b>	<b>6.7</b>	<b>1.8</b>

Source: Expenditure and Food Survey 2001-02; General Household Survey

\* Excludes housing, licenses/fines/transfers, holiday spending, money transfers and credit

3.22 The next section describes the reliance of the West Midlands economy on the tobacco industry and spending on tobacco products in order to sustain employment. The remaining sections of this report use these figures and the key statistics given above to analyse the effects of smoking in the West Midlands in terms of the costs of treatment and the impact on business.

## 4. Health

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### Methodology

- 4.1 In modelling the costs to the NHS of treating smokers, a list of smoking-related diseases was established, including all conditions caused or severely aggravated by smoking<sup>4</sup>. Unfortunately, personal information attached to hospital episode statistics does not include data on whether an individual patient is a smoker in enough cases for it to be used safely. This point, along with a number of other data collection and usage issues, are discussed further in the recommendations section of this report.
- 4.2 The list of conditions has therefore been divided into quartiles, with diseases such as lung cancer in the top quartile given a probability of 0.875 that a patient suffering from this condition is a smoker or ex-smoker (diseases in the top quartile assume that 75%-100% of patients are smokers or ex-smokers and hence a mid-point probability of 0.875 is assigned). Those conditions falling into the bottom quartile of diseases have been assigned a probability of 0.27, as this is the average prevalence rate of smoking among the wider population.
- 4.3 Based on this methodology, the number of people suffering from smoking-related diseases *and who are likely to be smokers* has been calculated and used to determine the costs to the health service. Clearly, smokers will be treated for diseases other than the ones focused on in this research, but the impact of smoking on these other conditions is likely to be minimal and is therefore not included. The costs are therefore the 'additional costs' smoking brings to the NHS.
- 4.4 The full list of conditions and their assigned probabilities is included in Appendix A to this report. The appendix also compares the model used in this study to figures used in the Health Education Authority's 1995 study, The Smoking Epidemic. The figures show that where direct comparisons can be drawn for individual cancer, circulatory and digestive diseases, the model used in this study is comparable to figures used in the 1995 HEA report.
- 4.5 The methodology used in this study also produces a total number of smoking-related deaths which is in line (proportionally) with national figures.

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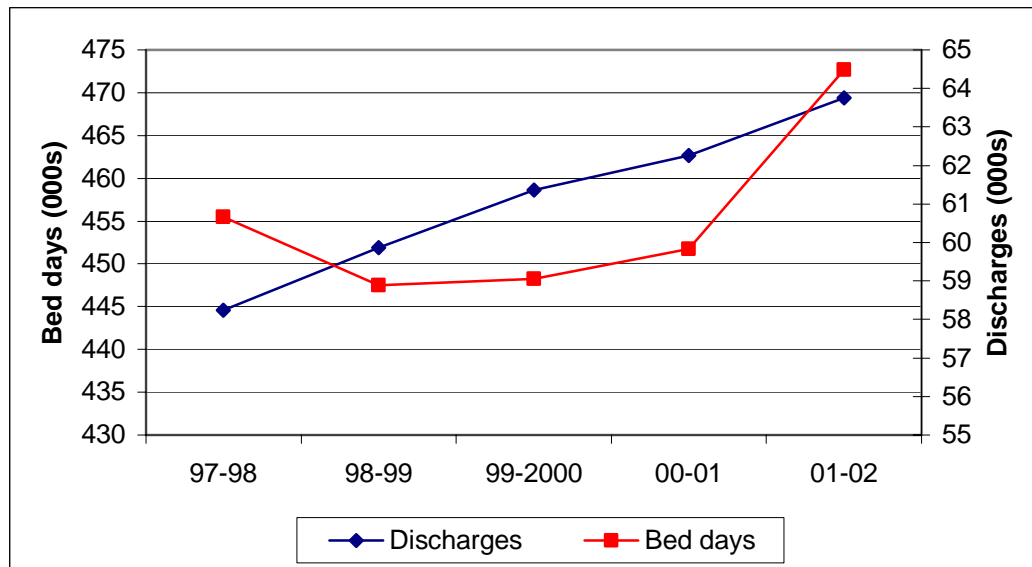
<sup>4</sup> The list of conditions is based on all cancer, respiratory, heart, circulation and digestive conditions which are recorded as being smoking-related diseases in hospital episode statistics.

### Costs of treatment

4.6 The clearest economic impact of tobacco use is the financial costs for the health service in treating patients for smoking-related diseases. In 2001-2002, hospitals in the West Midlands treated a total of 154,084 people for smoking-related conditions, who collectively used 1,165,255 bed days.<sup>5</sup> Based on the methodology outlined above, it is estimated that 63,754 of these were smokers (41%) and that smokers accounted for 472,661 bed days (41%)<sup>6</sup>.

4.7 Figure 1 below shows that the number of smokers treated for smoking-related diseases has risen steadily from 1997-1998 to a peak of over 63,700 in 2001-2002 (a rise of 9.5%). The number of bed days taken up by smokers has risen by 3.4% in four years to over 472,000 in 2001-2002.

**Figure 1 Treatments of smoking-related diseases in the West Midlands**



Source: West Midlands Hospital Episode Statistics

4.8 The ratio of bed days per patient treated for smoking-related diseases has fallen from 7.8 in 1997-1998 to 7.4 in 2001-2002. This implies that, as the number of patients has increased, the NHS has worked more efficiently (in terms of developing new treatment and recovery practices) to meet more demand.

<sup>5</sup> It should be noted that not all of these patients will be West Midlands residents. However, for the purposes of this study, it is assumed that no significant net gain or loss of patients to other regions occurs.

<sup>6</sup> As the model is based on the proportion of cases for each smoking related disease that are likely to be caused by smoking, the figures include both current and ex-smokers (i.e. the total number of patients who are treated for a particular condition due to smoking at some point).

4.9 The costs involved in treating this number of patients who are smokers are substantial. The average cost of a general medicine bed day in the West Midlands is around £200. The average cost of treating *smoking*-related diseases is around double this figure, at £400 per bed day across the range of treatments and care needed.<sup>7</sup>

**4.10 Consequently, the cost of treating West Midlands smokers for smoking-related diseases in 2001-2002 is estimated to have been almost £190m.**

4.11 However, there are several further sets of additional costs, including the cost of premature deaths of smokers from smoking, the costs of outpatient and follow-up appointments for smokers suffering from smoking-related diseases, the costs of lost earning time for those requiring hospital treatment and the costs of effects of second hand smoking. In calculating the costs involved in each of these areas, we use the following definitions for each of the terms below:

- **Working life years:** The number of years of life from 16-65 years old. A smoker dying from a smoking-related disease at 45 years of age would lose 20 working life years, for example.
- **Pension life years:** The number of life years between the end of the working life period and the average life expectancy. For men, this has been taken to be between 65 and 75 years of age; for women between 65 and 80.
- **Cumulative costs:** The total costs involved in the premature death of all smokers. This adds together the costs of all working life years and pension life years lost.
- **Single life year:** The next 12 month period of a smoker's life. For example, if a smoker dies aged 52 and was in work, the **single year costs** would be the loss of the smoker's earnings and associated costs to the local economy during the 12 months directly after the smoker's death.

### **Deaths from smoking**

4.12 In the worst cases, there is a direct economic impact of smokers dying early from their habit and the consequent loss of economic output from those West Midlands residents.

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<sup>7</sup> Figures are based on national NHS data and regional data from University Hospital Birmingham and Herefordshire PCT.

- 4.13 In 2000, the year for which the most recent data is available, ONS mortality data shows that 27,982 people died from smoking-related diseases (including both those who died in hospital and elsewhere). Based on the same methodology as described at the beginning of this chapter, it is estimated that 12,190 (44%) of those patients were smokers.
- 4.14 Using an average life expectancy of 75 years for men and 80 for women, and a working age defined as 16-65 years, Table 7 shows that premature deaths among smokers accounted for the loss of over 60,000 life years, some 16,500 working life years and 43,500 pension years.

**Table 7 Years lost from deaths of smokers from smoking-related diseases, 2000**

	Female		Male		Total	
	No.	%	No.	%	No.	%
Deaths	5,653	46.4	6,537	53.6	12,190	100.0
Life years lost	26,282	43.8	33,785	56.2	60,067	100.0
Working life years lost	5,086	30.8	11,436	69.2	16,523	100.0
Pension life years lost	21,182	48.7	22,337	51.3	43,519	100.0

Source: West Midlands Hospital Episode Statistics; ONS Mortality Data

- 4.15 The table also shows that more men died from smoking than women. Men were also more likely to die younger (63.0 years old) compared with their female counterparts (63.8 years old). However, the difference in average death rate is small and, on average, life expectancy is higher for women (80 years old) than it is for men (75). This implies that while men die younger, the number of life years lost per women is greater.
- 4.16 Table 8 shows that, in 2001, two thirds of the working age population in the West Midlands (67.7%) were in employment, with men (70.3%) more likely to be working than women (65.1%). Men were also more likely to be employed on a full-time basis and to be earning more in these positions; women were more likely to be in part-time jobs and, on average, earning more than their male counterparts in these types of jobs.

**Table 8 Working population and wages by gender, 2001**

Gender	Population	Working full-time		Working part-time	
		No.	Average weekly wage (£)	No.	Average weekly wage (£)
Male	1,710,540	1,048,060	460.48	154,544	128.09
Female	1,706,244	555,320	339.49	555,839	131.91

Source: Mid-year Population Estimates 2001; Annual Business Inquiry 2001; New Earnings Survey 2001

- 4.17 It is also estimated that, for those people not in employment and of a working age, the average weekly income (after housing costs) is £70. This figure is based on data from Jobcentre Plus and the Department for Work and Pensions. It represents a conservative estimate, assigned to people in a broad range of economic scenarios, and includes those receiving Job Seekers' Allowance, income support, child benefit, disability allowance and incapacity benefit, as well as those who do not receive any direct income.
- 4.18 In addition, the Department for Work and Pensions calculates that, on average, the gross income per week of pensioners in 2001-2002 is £207 (net after housing costs).<sup>8</sup> This is the average amount per pensioner and takes into account different incomes for single people and couples.
- 4.19 Combining these figures with data from the two tables above, it is possible to calculate the estimated costs of lost earnings and spending power of West Midlands smokers.<sup>9</sup> Table 9 below shows that the total loss of earnings (for the whole of the remainder of individuals' working lives) from premature death due to smoking is estimated to be £234m. In addition, and more significantly, lost income from life years lost in retirement is estimated to be £468m.
- 4.20 It is therefore estimated that the total cumulative cost of premature deaths of smokers is £703m.**

**Table 9 Cumulative costs of death of smokers from smoking-related diseases (£000s)**

	Working life				Pension life	Total
	Full-time	Part-time	Not working	Total		
Female	29,222	11,365	6,457	47,044		
Male	167,780	6,882	12,361	187,023		
<b>Total</b>	<b>197,002</b>	<b>18,247</b>	<b>18,818</b>	<b>234,067</b>	<b>468,439</b>	<b>702,505</b>

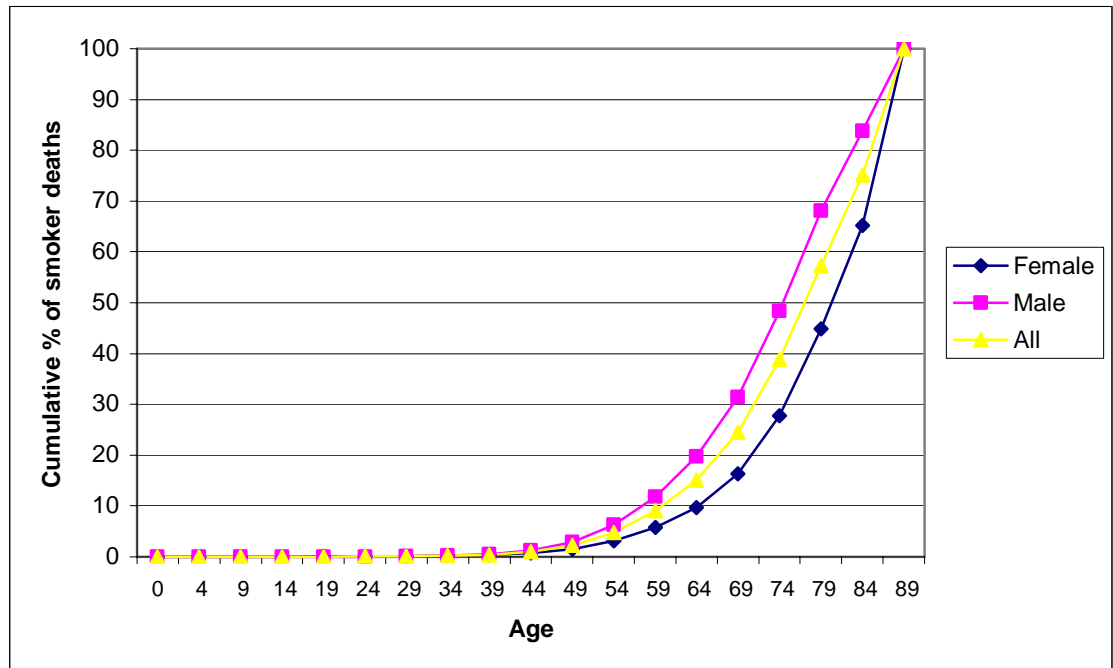
Source: West Midlands Hospital Episode Statistics; ONS Mortality Data; Department for Work and Pensions; Mid-year Population Estimates 2001; Annual Business Inquiry 2001; New Earnings Survey 2001; Jobcentre Plus

<sup>8</sup> The Pensioners' Income Series 2001-2002, Department of Work and Pensions.

<sup>9</sup> Data from the New Earnings Survey is categorised by Standard Occupational Classifications codes (SOCs), whereas smoking prevalence rates are categorised according to the 2001 National Statistics Socio-Economic Classifications (NS-SECs) which replace the Social Class classifications based on occupation and Socio-Economic Group (SEG). There are difficulties in mapping SOCs to NS-SECs accurately (without assessing individual records) and because the two systems do not 'fit' together, this report has not weighted NES data per occupation by different prevalence rates in NS-SEC categories. This issue is discussed further in the recommendations section of this report.

4.21 It has already been shown that more men than women die from smoking each year in the West Midlands. Figure 2 below shows that less than five percent of deaths from smoking occurred below the age of 50 and almost one fifth were among those aged 75-79. However, men were more likely to die younger than women: a fifth of male smokers died of smoking-related diseases before retirement age compared with only ten percent of women.

**Figure 2 Cumulative percentage of deaths from smoking in the West Midlands, 2000**



Source: West Midlands Hospital Episode Statistics; ONS Mortality Data

4.22 Using this data for the age distribution of deaths by gender, and assuming the same workforce proportions and income figures as detailed above, it is possible to calculate the impacts of people dying during a single year. Table 10 below shows the costs of deaths, assuming each person who died in 2000 lived for one more year. The total cost of lost earnings for employees is over £24m, while a further £2m has been lost among those not in employment. A total of over £111m in income for those in retirement has also been lost due to death from smoking.

**4.23 It is therefore estimated that the total costs of premature deaths of smokers in 2001 was £138m.**

**Table 10 Costs of death of smokers from smoking-related diseases in 2001 (£'000s)**

	Working life				Pension life	Total
	Full-time	Part-time	Not working	Total		
Female	3,142	1,222	694	5,059		
Male	18,883	775	1,391	21,049		
<b>Total</b>	<b>22,026</b>	<b>1,997</b>	<b>2,086</b>	<b>26,108</b>	<b>111,432</b>	<b>137,540</b>

Source: West Midlands Hospital Episode Statistics; ONS Mortality Data; Department for Work and Pensions; Mid-year Population Estimates 2001; Annual Business Inquiry 2001; New Earnings Survey 2001; Jobcentre Plus

### Outpatient appointments

4.24 Firstly, a proportion of patients will require outpatient appointments. Unfortunately, while all bed days are recorded, follow up treatment is only linked to individual patient records and not attached to hospital episode statistics.

4.25 If it is assumed that, on average, each smoker who requires hospital treatment also requires one outpatient appointment (with no follow-up appointment), then an estimate of the costs to the NHS can be determined. On average, the cost of a first attendance outpatient appointment is £151 (and £87 for follow-up appointments) at 2001 prices.<sup>10</sup>

**4.26 It is therefore estimated that the cost of providing outpatient appointments to smokers who require additional treatment for smoking-related diseases is £9.6m.**

4.27 If each of these patients also required a follow-up appointment after their first outpatient appointment then this would add a further £5.5m of cost to the health service.

### Lost earnings

4.28 In addition, there are substantial costs to the local economy and businesses in time off work for those who are employed and who require hospital treatment. Table 11 below shows the costs to business in terms of the amount of equivalent money a company would have to pay in order to cover the time off for the hospitalisation of a smoker.

<sup>10</sup> Figures are based on national NHS data and regional data from University Hospital Birmingham and Herefordshire PCT.

4.29 These sums have been calculated by using the proportion of smokers suffering from smoking-related diseases who are of working age and who are likely to be in employment and applying an average distribution of earnings according to mean figures from the New Earnings Survey.

**4.30 It is estimated that £4.0m of working time is lost to the West Midlands each year attributable to hospital treatment needed by smokers due to smoking.**

**Table 11 Cost to business of hospital treatment of smokers (£000s)**

Gender	Working life		
	Full-time	Part-time	Total
Female	845	235	1,080
Male	2,812	115	2,927
<b>Total</b>	<b>3,656</b>	<b>351</b>	<b>4,007</b>

*Source: West Midlands Hospital Episode Statistics; Mid-year Population Estimates 2001; Annual Business Inquiry 2001; New Earnings Survey 2001*

4.31 It should be noted that we have not included the costs to the economy of people of working age missing work (through paid leave or otherwise) in order to accompany dependents, family or friends who are attending hospital for treatment.

### **Second hand smoke<sup>11</sup>**

4.32 A number of non-smokers will suffer ill health and require treatment due to the effects of second hand smoke. Research publicised by Chief Medical Officer, Sir Liam Donaldson, estimates that (proportionally) approximately 100 people in the West Midlands die of second hand smoke every year<sup>12</sup>. If it is assumed that the ratio of deaths to bed days of treatment required for smokers also holds for those suffering the effects of second hand smoking, then (based on hospital episode statistics for the West Midlands) it is possible to approximate the economic impacts of second hand smoking.

4.33 Table 12 shows that the annual cost to the NHS of treating people suffering the effects of second hand smoke is £1.6m, while the total cost to the West Midlands economy in 2001 (including the impact of health service treatment, time off work for hospital treatment, lost earnings and income) was £2.7m.

<sup>11</sup> This study uses the term 'second hand smoke' in place of 'passive smoking'.

<sup>12</sup> Tobacco Smoke Pollution: the Hard Facts, Royal College of Physicians, 2003

**Table 12 Estimated costs of second hand smoke in the West Midlands (£000s)**

	<b>Costs</b>	<b>Total</b>
<b>Hospital</b>	Treatment	1,550
	Hospitalisation time of workers	37
	<b>Total</b>	<b>1,587</b>
<b>Single year</b>	Working age life years lost - working	197
	Working age life years lost - not working	17
	Pension life years lost	914
	<b>Total</b>	<b>1,128</b>
<b>Cumulative</b>	Working age life years lost - working	1,766
	Working age life years lost - not working	154
	Pension life years lost	3,843
	<b>Total</b>	<b>5,763</b>
<b>Total</b>	<b>Total costs for 2001</b>	<b>2,716</b>

*Source: West Midlands Hospital Episode Statistics; ONS Mortality Data; Department for Work and Pensions; Mid-year Population Estimates 2001; Annual Business Inquiry 2001; New Earnings Survey 2001; Jobcentre Plus*

- 4.34 The total 'health' costs are substantial and also produce more knock-on effects. The full consequences of time off work due to illness caused by smoking and second hand smoke are further detailed in the following Business section of this report.

## 5. Business

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- 5.1 The Health section of this report has established the costs to business that are attributable to time off work taken by those requiring hospital treatment due to the effects of smoking. There are many more instances, however, where the effects of smoking result in time off work that do not require time in hospital. This section details the likely additional costs to businesses in the West Midlands that can be traced to the proportion of its workforce who smoke.
- 5.2 Action on Smoking and Health (ASH) estimates that over 3m working days are lost to West Midlands industry due to smoking-related sick leave every year.<sup>13</sup> It has been shown that smokers in the West Midlands accounted for 472,661 bed days in 2001-2002. Of these, it is estimated that those of a working age and in employment accounted for 70,749 bed days.
- 5.3 However, Table 13 below shows hospital bed days account for only the tip of the iceberg in terms of the total amount of time lost to businesses. Assuming an average of one outpatient appointment and two GP appointments per employed smoker of working age, it is estimated that employees in the West Midlands who smoke take a total of almost 3m sick days every year due to their habit.

**Table 13 Smoking-related sick days of workforce in the West Midlands (per year)**

	No. of days off	% of days
Hospital bed days	73,957	2.4
Outpatient days (@ one day per smoker)	17,888	0.6
GP days (@ two days per smoker)	35,776	1.2
'Home' sick days	2,966,378	95.9
<b>Total non-inpatient sick days</b>	<b>3,020,043</b>	<b>97.6</b>
<b>Total sick days</b>	<b>3,094,000</b>	<b>100.0</b>

Source: West Midlands Hospital Episode Statistics; ASH

- 5.4 There are substantial costs in equivalent wages paid to smokers who take time off due to ill health caused by smoking. Table 14 shows that the total cost in equivalent wages of time taken off for this reason.

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<sup>13</sup> ASH estimates that 34m million working days are lost to British industry every year from smoking-related sick leave. Using the proportion of the workforce in Great Britain that is employed in the West Midlands, it is estimated that 3,094,000 smoking-related sick days are lost to the West Midlands economy annually.

- 5.5 Its is estimated that the costs to businesses in the West Midlands in equivalent wages of smokers taking sick leave for ill health caused by smoking is £196m.

**Table 14 Cost of smoking-related sick days (£000s)**

Gender	Full-time	Part-time	Total
Female	36,078	14,031	50,109
Male	140,347	5,757	146,104
<b>Total</b>	<b>176,425</b>	<b>19,788</b>	<b>196,213</b>

Source: West Midlands Hospital Episode Statistics; Annual Business Inquiry 2001; New Earnings Survey 2001; ASH

- 5.6 There are also substantial costs involved for businesses that have a proportion of their workforce who smoke and take time out during the working day to indulge their habit.
- 5.7 The 2001 General Household Survey estimates that, across England, 27% of all people aged 16 and over smoke (28% of men and 25% of women) and these national figures have been used here for the purposes of estimating the costs to business of loss of working time taken up by smoking by staff.
- 5.8 Table 15 below shows the total number of workers in the West Midlands and the percentage who smoke categorised by National Statistics Socio-Economic Classifications (NS-SECs).

**Table 15 Smoking prevalence in the West Midlands workforce by gender and NS-SEC**

NS-SEC	Total workers (000s)		Smoking rates (%)		Smoking workers (000s)	
	Male	Female	Male	Female	Male	Female
Higher managerial	87	30	15	15	13	4
Higher professional	111	41	17	12	19	5
Lower managerial and professional	303	330	24	20	73	66
Intermediate	80	250	28	27	22	68
Small employers/own account workers	180	66	30	26	54	17
Lower supervisory and technical	211	80	33	27	70	22
Semi-routine	202	296	33	32	67	95
Routine	234	167	36	33	84	55
<b>Total</b>	<b>1,409</b>	<b>1,259</b>	<b>28</b>	<b>25</b>	<b>402</b>	<b>331</b>

Source: Population Census 2001; Department of Health; General Household Survey 2001

5.9 Based on the data above, it is possible to calculate the amount of time smoking takes out of the working day in the West Midlands economy by making assumptions about the prevalence of smoking among the workforce and the quantity of tobacco consumed during working hours. The methodology used in constructing this model is detailed in Appendix B.

### The costs

5.10 Allowing for the assumptions as explained at the end of this report, Table 16 shows that, on average, smokers lose 5.7% of their working day due to breaks from smoking. It should be noted, however, that if smokers gave up their habit, not all working time would be returned to 'productive use', as staff may take additional breaks for other things to replace smoking.

5.11 Businesses in the West Midlands would have to pay an additional £2.9m in wages every working day to cover the time smokers are effectively absent from their jobs due to smoking, most of which are due to male full-time workers (as this group makes up the majority of the West Midlands workforce).

**Table 16 Costs of staff smoking during the working day in the West Midlands**

	Lost time (%)			Cost per day (£000)			Cost per year (£000)		
	Male	Female	All	Male	Female	All	Male	Female	All
Full-time	6.3	5.2	5.9	2,015	586	2,601	469,569	136,425	605,995
Part-time	6.3	4.2	4.7	83	182	265	19,261	42,446	61,707
<b>Total</b>	<b>6.3</b>	<b>4.9</b>	<b>5.7</b>	<b>2,098</b>	<b>768</b>	<b>2,866</b>	<b>488,830</b>	<b>178,872</b>	<b>667,702</b>

Source: Population Census 2001; Department of Health; General Household Survey 2001; New Earnings Survey 2001

5.12 It is estimated that the loss of working time for cigarette breaks costs businesses in the West Midlands £668m in equivalent wages every year.

## **6. Employment**

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- 6.1 In this section, we describe the employment in the West Midlands that is dependent on the manufacture, retail and wholesale of tobacco and tobacco products and the likely consequences to the total workforce of reducing levels of tobacco consumption in the region.
- 6.2 Only a small percentage of employees across Great Britain work in the tobacco manufacturing industry. The 2001 Annual Business Inquiry reports that only 3,532 people were employed in the sector, equating to just 0.01% of the workforce. In the West Midlands, there are no people employed in manufacturing tobacco.
- 6.3 Using Standard Industrial Classifications (SIC) to pinpoint tobacco-related employment is imprecise. But Table 17 below gives the total number of people employed directly in tobacco-related production and sales and in sectors that sell tobacco products as part of their product range (and hence support some level of employment through the sale of tobacco products).
- 6.4 The two largest sectors involved in selling tobacco products (in terms of employment) are: non-specialised food/tobacco/beverage stores (retail), which account for 81,165 employees in the wholesale/retail/agent sale of food, tobacco & beverages industry; and pubs and bars, which employ over 53,000 people across the West Midlands. A total of over 156,000 are involved (to varying degrees) in the sale of tobacco in the West Midlands, although the number of people employed to sell tobacco exclusively is far smaller.
- 6.5 It is estimated that, in 2001, 2,183 people in the West Midlands were employed in the exclusive wholesale and retail of tobacco products. In the West Midlands, there are no people employed in manufacturing tobacco.**

**Table 17 Tobacco-related employment in the West Midlands (2001)**

	No.	%
Manufacture of tobacco products	0	0.0
Wholesale/retail of tobacco only <sup>14</sup>	2,183	0.1
Wholesale/retail/agent sale of food, tobacco & beverages	88,068	3.8
Pubs & bars	53,272	2.3
Garages	4,648	0.2
Retail sale of books/newspapers, etc	7,892	0.3
<b>Tobacco-related total</b>	<b>156,063</b>	<b>6.7</b>
<b>Total employment</b>	<b>2,313,765</b>	<b>100.0</b>

Source: Annual Business Inquiry 2001

- 6.6 While pubs, petrol stations, supermarkets, grocers, off-licenses and newsagents all sell a significant amount of tobacco products, the actual number of jobs directly reliant on cigarettes, cigars and hand-rolling tobacco is negligible.
- 6.7 A series of studies into the tobacco economy in Sandwell<sup>15</sup> surveyed a wide range of businesses that sell tobacco products across what in 1999 was defined as the Sandwell Health Authority area (this area is no longer in existence). This research analysed the volume and value of sales and the amount of turnover and employment dependent on tobacco products. The research found that, while tobacco was an important element in the product range offered by such businesses (the sale of which contributed a substantial proportion of company turnover in some cases), the sale of cigarettes did not add much to *profit* levels and did not directly support the employment of staff in many cases.
- 6.8 On average, 17% of turnover was attributable to tobacco, with cash and carry establishments reporting the highest level (40% of turnover) and leisure centres the lowest (2%). However, profit levels on tobacco sales were far lower than for other product lines. The average margin reported among Sandwell retailers in 1999 was just 6.4% on cigarettes, although levels ranged from 7.9% at petrol stations to just 0.3% in cash and carry firms. Three quarters of the businesses in Sandwell that sold tobacco products (and responded to the survey) reported that profit margins were lower than for other product lines.

<sup>14</sup> The vast majority of employment within this sector is in the retail sale of tobacco products category. Due to the small numbers of employees in the wholesale of unmanufactured tobacco and wholesale of tobacco products, it is not possible to give these figures separately because of the data confidentiality requirements of the ABI.

<sup>15</sup> *Curing the Tobacco Economy – Tobacco Retailing and Employment in Sandwell*, UK Research Partnership (1989); *Cure or Kill? Treating the Tobacco Economy in Sandwell*, UK Research Partnership (1999).

- 6.9 However, tobacco products perform a wider commercial function for retailers than generating sales and profits in their own right. For the most part, tobacco is an important 'traffic builder' and is perceived to be a key anchor for some retailers and a 'service to customers' for others. As one small retailer surveyed in the study reported, "people always buy something else when they buy tobacco" and hence, only when tobacco products are bought as single purchase items is there a possibility that selling these products could become uneconomic. It is the 'knock-on' effects of selling tobacco that are likely to contribute to supporting employment in the West Midlands among wholesalers and retailers who stock such items.
- 6.10 If average turnover and profit levels recorded in the study of Sandwell retailers are applied to the West Midlands overall, it is possible to estimate the proportion of employment in tobacco-selling businesses that rely on income generated by smokers. If it is assumed that the 6.4% of profit on 17% of sales is used to employ staff with income generated from tobacco sales, then 1.088 jobs per hundred in businesses selling tobacco products as part of their product range rely on spend from smokers.
- 6.11 We can use the numbers employed in such firms shown in Table 17 above and apply this ratio to the 156,063 people employed in tobacco-related retailers and wholesalers.
- 6.12 On this basis, it is estimated that, in addition to the 2,183 people employed in businesses that exclusively sell tobacco, a further 1,674 are supported in employment in businesses that sell tobacco as part of a wider product range as a result of spending on tobacco. A total of 3,857 people are therefore estimated to be employed in the West Midlands as a result of tobacco spending.**

- 6.13 But what would happen if the number of smokers fell in the West Midlands (and consequently the amount of money spent on tobacco products)? Research exploring the impact of reducing tobacco consumption on employment in the UK<sup>16</sup> concluded that the effect would be positive. Given the nature of tobacco manufacturing, the industry's supply chain, the high levels of tax (and low levels of profit), a reduction in tobacco consumption would actually yield an increase in the total number of people employed in the UK.
- 6.14 The research uses an input-output model of the UK economy to explain that the tobacco industry has a very low output-employment ratio (that is, it is not very labour intensive). If smokers quit and spend their money in the same way as others who have recently quit, then the money will be spent largely on other goods and services (as well as on transport and communication, recreation, entertainment and education), which have an output-employment ratio that is nine times higher than the tobacco industry. The report therefore argues that a 40% reduction in tobacco consumption would create up to 165,000 jobs (125,000 full-time equivalents)<sup>17</sup>.
- 6.15 Unfortunately, no input-output tables were available to the research team for the current study, and so exact employment modelling of this kind has not been possible. However, if the above model is applied to the West Midlands economy, a similar 40% reduction in tobacco consumption would yield a net gain of 14,600 jobs (11,000 full-time equivalents). This equates to around £203m in additional wages earned by those who would gain employment as a result of a two-fifths fall in tobacco consumption levels.
- 6.16 It is estimated that a 40% reduction in tobacco consumption in the West Midlands would yield 11,000 additional jobs for the region and boost wage earnings by a total of £203m.**

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<sup>16</sup> *Tobacco and Jobs: The impact of reducing consumption on employment in the UK*, David Buck, Christine Godfrey, Martin Raw, Matthew Sutton, Society for the Study of Addiction, Centre for Health Economic, The University of York, 1995.

<sup>17</sup> A 40% reduction of the 1990 level of tobacco expenditure was the national Health of the Nation target.

## 7. Fire

- 7.1 In this section, we estimate the costs to the region of fires attributable to people who smoke. Data on the number, location and cause of fires, and the number of deaths and injuries resulting, is sourced from the Office for the Deputy Prime Minister's UK Fire Statistics 2000 (unless stated otherwise).
- 7.2 In 2000, there were an estimated 41,873 fires across the five fire brigade areas<sup>18</sup> that make up the West Midlands region, resulting in 63 deaths and 1,303 non-fatal casualties.
- 7.3 Although only around 15% of fires in the region occurred in dwellings in 2000, it is estimated that these fires accounted for the vast majority of deaths (81%) and injuries (81%). Using the proportion of deaths and injuries that occurred in fires in the UK whose source of ignition was attributed to smokers' materials, Table 18 below estimates the number of deaths and injuries in the West Midlands that are linked to smoking.

**Table 18 Estimated deaths and injuries in fires in West Midlands whose source of ignition was smokers' materials, 2000**

	Deaths	Non-fatal injuries
No. of all deaths	63	1,303
% caused by smokers' materials	30.2	12.8
No. caused by smokers' materials	19	167

Source: DTLR; ODPM

- 7.4 Smokers' materials are given as the source of ignition of fires in three types of location: dwellings, other buildings and road vehicles. Using estimates based on the cause of fires across the UK, Table 19 gives the number of fires in the West Midlands likely to have smokers' materials as the source.

**Table 19 Estimated number of fires whose source of ignition was smokers' materials by location, 2000**

	Accidental fires in dwellings	Other buildings and business premises	Road vehicles
Total no. of fires	6,477	4,106	9,035
% caused by smokers' materials	8.0	9.2	0.3
No. caused by smokers' materials	519	380	26

Source: DTLR; ODPM

<sup>18</sup> Fire Brigades covering the West Midlands are Hereford & Worcester, Shropshire, Staffordshire, Warwickshire and West Midlands (Metropolitan County).

**7.5 In 2000, a total of 925 fires in the West Midlands are estimated to have been ignited by smokers' materials.**

7.6 It should be noted that around half of the fires in the West Midlands (20,254 out of 41,873) are classified as 'secondary fires' and occurred in derelict buildings (978), on grassland or heath land (6,544), and in refuse and derelict vehicles (11,361), while a further 942 fires occurred in chimneys. No information, however, is given as to the source of ignition of these fires and this study has not included any of these fires in the total of those linked to smoking.

7.7 Clearly, these fires, and the resulting deaths and injuries, have an impact on the local economy in terms of the loss of business and property, the loss of economic output of those killed or injured and the cost of the fire service responding to a fire. A study for the Office of the Deputy Prime Minister (ODPM)<sup>19</sup> describes the cost of economic fire under three main headings:

- **Costs in anticipation** – costs incurred to avoid fires and recoup losses, including fire protection costs, fire service activity and insurance administration costs.
- **Costs as a consequence** – including costs of property losses, casualties and injuries and business disruption.
- **Costs in response** – cost of the fire service responding to a fire.

7.8 It should be noted that the economic costs of deaths and injuries in terms of lost life and pension years and time off work caused by fires is calculated using a different methodology from the other main chapters in this report. No data is available on the severity of injury caused by fire or the type and duration of treatment required (and hence the likely duration of economic activity lost). Instead, Home Office research on the economic costs of fire<sup>20</sup> uses planning figures from the Department of Transport, Local Government and the Regions (DTLR) to approximate the economic cost of loss of life and injury, based on three main impacts:

- **Healthcare costs** – costs to the NHS of treatment required patients suffering injuries caused by fire.
- **Lost output** – costs of time off work and the resulting loss of productivity.

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<sup>19</sup> The Economic Costs of Fire: Estimates for 2000, ODPM, 2003

<sup>20</sup> The Economic Costs of Fire, Home Office Research Study 229, 2001

- **Emotional and physical suffering** – costs based on the value society places on preventing incidents occurring.

7.9 Using this methodology to estimate the economic costs of death and injury caused by fires linked to smoking, Table 20 shows that the total cost to the regional economy of fires whose source ignition is smokers' materials is £24.2m.

**Table 20 Estimated costs of fires in West Midlands whose source ignition is smokers' materials, 2000**

Location	No. caused by smokers' materials	Total average cost per fire (£)	Total costs (£)
Accidental fires in dwellings	519	23,800	12,361,050
Other buildings and business premises	380	31,000	11,765,933
Road vehicles	26	2,800	72,269
<b>Total</b>	<b>925</b>		<b>24,199,252</b>

Source: DTLR; ODPM; Home Office

7.10 The total cost to the regional economy of fires whose source ignition is smokers' materials is estimated to be £24.2m in 2000.

## 8. Attitudes

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- 8.1 There is currently much attention focused on whether the Government should implement a ban on smoking in public places – and whether this would be an astute political move and acceptable in the eyes of the public. In late 2003, the Chief Medical Officer, Sir Liam Donaldson, expressed his desire to see smoking in public spaces banned to protect non-smokers from passive smoking. More recently, leaders from all UK Medical Royal Colleges and their Faculties formed an alliance to reiterate their wish to see smoking banned in public places, including all workplaces, with particular emphasis on restaurants and pubs.
- 8.2 The Government has rejected such calls for bans, arguing that the current voluntary system is successful, with 50% of workplaces currently enforcing a no-smoking policy. However, this still leaves half of all workplaces free for smokers to damage the health of non-smoking colleagues and it is estimated that second hand smoke kills over 1,000 people a year – three times the number who die in workplace accidents.
- 8.3 The WMPHG and partners have a strong platform from which to lobby for a ban on smoking in certain public places. Table 21 below shows that, according to the West Midlands Lifestyle Survey conducted in 2001, there is overwhelming support among the region's residents for no smoking policies to be initiated on all public transport, in cinemas and theatres, and in schools and colleges.

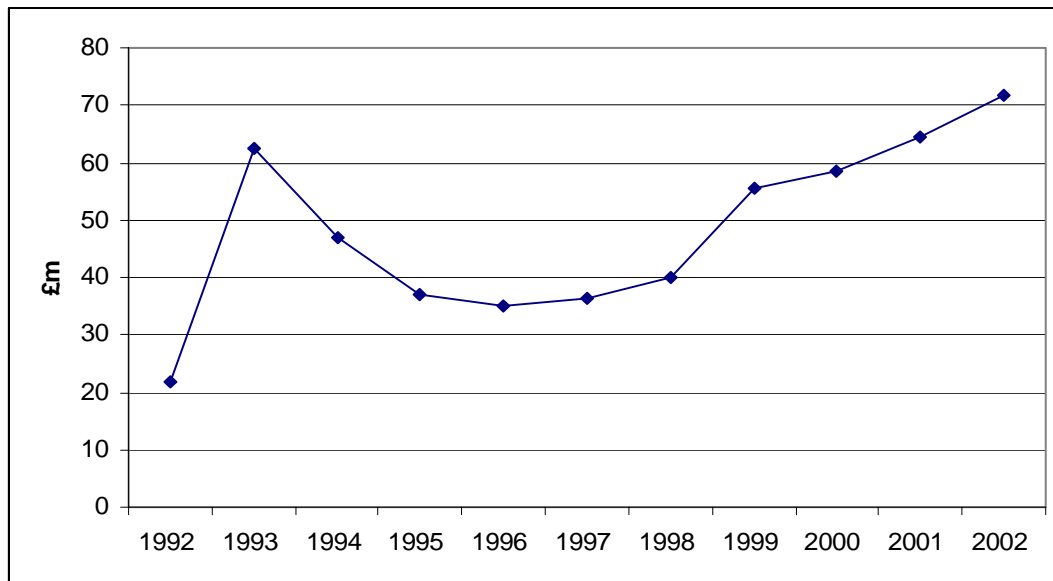
**Table 21 Views on banning smoking in public places (percent)**

Location	Banned completely	Banned in some areas only	Allowed in all areas	Don't know
Public transport	83.1	14.3	1.5	1.1
Restaurants/cafes	54.8	42.5	2.0	0.7
Pubs	22.8	61.5	13.3	2.4
Cinemas/theatres, etc	81.0	16.3	1.5	1.2
Workplace	48.9	45.9	3.6	1.6
Schools/colleges (up to 18)	82.7	14.2	1.4	1.7
Colleges/universities (18+)	52.4	43.0	2.4	2.2

Source: West Midlands Lifestyle Survey 2001

- 8.4 Local people are more divided when it comes to the issues of banning smoking in restaurants and cafes, colleges and universities and the workplace, with roughly a 50-50 split in each case. There is fairly low support, however, for smoking bans to be adopted in pubs and bars – less than a quarter of respondents would agree with a complete ban.

- 8.5 However, there is support for *restricting* smoking in all locations. Data from the 2002 General Household Survey shows that 86% of people support smoking restrictions at work, 88% support restaurant smoking restrictions and 54% agree that smoking should be restricted in pubs. A majority of people support smoking restrictions in pubs in all demographic groups apart from 16-24 years olds (37% support).
- 8.6 These statistics confirm support for a WMPHG campaign against public smoking. It should make use of public support where this exists and ensure that smoking is banned completely in all public arenas – transport, cinemas, theatres, schools and colleges (where this is not already the case).
- 8.7 The WMPHG should also target and engage workplaces – via trade unions, enforcement agencies and employers, where appropriate – to commit to a ban on smoking. Public sector buildings will (in the vast majority of cases) have such policies in place already, but other large employers should be engaged by directly selling the business and other benefits of smoking bans. Research suggests that a ban on smoking in the workplace would, nationally, immediately prompt 300,000 to quit smoking and save 150,000 lives in the long-term. The economic benefits of a healthier workforce, in terms of fewer working days lost to ill health and consequent increases in productivity (which are detailed in this report), should be spelt out to employers in an attempt to boost the proportion of workplaces that operate no smoking policies. Research has shown that fewer opportunities to smoke result in fewer smokers, which in turn continues the cultural shift towards a general non-acceptance of smoking in public.
- 8.8 This cultural shift, together with more pressure being exerted by public health bodies and national Government on smokers to quit, is reflected in the amount of money spent on smoking cessation aids in Great Britain. Figure 3 below shows that the amount of money spent on smoking cessation aids hit a peak in 1993, soon after their introduction in Great Britain. Sales in the sector then fell back for the following three years, but the value of the market steadily climbed again year-on-year until 2002, when £72m was spent on over-the-counter smoking cessation aids.

**Figure 3 Value of over the counter smoking cessation market in GB, 1992-2002**

Source: Marketing (28 January 1999); Proprietary Association of Great Britain

- 8.9 Over-the-counter sales have grown rapidly over the last few years, experiencing an 11.5% increase from 2001 to 2002 at pharmacy and grocery retail outlets. This compares to an increase of only one percent in the total value of over-the-counter sales across all self-care products in the same period. Based on the proportion of Great Britain's population located within the West Midlands, it is estimated that £6.5m was spent on over-the-counter smoking cessation products in the region in 2002.
- 8.10 In addition, it is estimated that £1.7m is spent on nicotine replacement therapies prescribed by GP practices in the West Midlands and a further £0.9m on Bupropion (Zyban).<sup>21</sup>
- 8.11 The total amount spent on cessation prescriptions and over-the-counter products, coupled with the recent growth experienced in this market, indicates a high (and growing) level of ambition among smokers to give up. Indeed, the 2001 West Midlands Lifestyle Survey found that over a quarter (27%) of smokers were ready to quit and that a further 53% were contemplating stopping. Less than a fifth (19%) of those who smoked had no interest in giving up.

<sup>21</sup> Prescribing Analyses and Cost (PACT), Prescription Pricing Authority, 2001.

8.12 Again, this implies that the potential to achieve a significant reduction in the number of people in the West Midlands who smoke is considerable. And based on the analysis in this report, it seems that a targeted campaign to lower tobacco consumption in the region would pay handsome economic dividends.

8.13 The next section of the report:

- draws together our conclusions about modelling the effects of tobacco consumption on the public sector, business and the local economy;
- calculates the likely economic consequences of a reduction in the number of smokers.

## 9. Conclusions

- 9.1 The analysis in this report shows that the economic impacts of smoking among West Midlands residents are substantial. Table 22 below shows that, in 2001, the total cost of treating smokers and suffering the consequences of premature death, ill health and loss of productivity amounts to more than £1.25bn.

**Table 22 Total costs to the regional economy of smoking**

Area	Cost (£m)
Costs of treating smokers for smoking-related diseases	189.0
Cost of premature death of smokers in 2001	137.5
Cost of outpatient appointments for smokers	9.6
Cost of follow-up appointments for smokers	5.5
Cost of hospital treatment time to businesses	4.0
Costs of second hand smoke	2.7
Cost of smoking-related sick days	196.2
Costs of staff smoking during working day to businesses	667.7
Cost to economy in spend on tobacco (assuming all spend shifted to other goods and services in regional economy)	9.8
Cost to NHS of providing services to help stop smoking	3.0
Cost of prescription NRTs and Bupropion	2.6
Costs of fires caused by smoking	24.2
<b>Total</b>	<b>1,251.8</b>

Source: West Midlands Hospital Episode Statistics; ONS Mortality Data; Department for Work and Pensions; Mid-year Population Estimates 2001; Annual Business Inquiry 2001; New Earnings Survey 2001; Jobcentre Plus; Population Census 2001

- 9.2 **It is estimated that smoking cost the West Midlands economy over £1.25bn in 2001.**
- 9.3 Although smoking rates have almost continually declined, from a high of 52% in the post-war era to 27% in 2001, the proportion of people who smoke appears to have levelled off. Since 1998, the percentage of people who smoke has remained constant.
- 9.4 Our overview of national policy reported that the Government aims to reduce the overall rate among adults (over 16 years of age) to 24% by 2010. But what are the economic consequences of achieving a reduction in the number of smokers?

- 9.5 Using data from 2001, it is estimated that 5.8% of smokers end up in hospital each year and that 1.1% of smokers die every year. If a smoking intervention strategy results in a one percentage point reduction (from 27% to 26%) in the total number of smokers (assuming that the ratio between all demographic categorisations remains unchanged and that those removed from the smoking population are, on average, no more or less likely to require hospital treatment or die), then the economic consequences of such an intervention are considerable, as shown in Table 23 below.

**Table 23 Impacts of a one percentage point reduction (from 27% to 26%) in the number of smokers in the West Midlands**

	Area	Impact
<b>People</b>	Smokers	-40,970
	Inpatients	-2,363
	No. bed days	-17,507
	Deaths	-452
	Additional jobs	1,019
<b>£</b>	Cost of bed days	-£7,002,000
	Additional earnings from workforce (from fewer deaths)	£967,000
	Additional spend by those in retirement (from fewer deaths)	£4,127,000
	Cost of outpatient appointments	-£356,000
	Cost of follow up appointments	-£204,000
	Costs of second hand smoke	-£100,000
	Cost to business of hospital treatment time	-£148,000
	Cost to business of smoking-related sick days	-£7,267,000
	Cost to business of staff smoking during the working day	-£24,730,000
	Additional wages from additional jobs	£18,796,000
	Cost of fires caused by smoking	-£896,000
	<b>Net gain</b>	£64,594,000

Source: West Midlands Hospital Episode Statistics; Department for Work and Pensions; Mid-year Population Estimates 2001; Annual Business Inquiry 2001; New Earnings Survey 2001; Jobcentre Plus; Population Census 2001

- 9.6 It is estimated that a one percentage point reduction in smokers (from 27% to 26%) across all demographic groups (in the ratios that make up the current smoking population in the West Midlands) would yield a net saving of £64.6m per annum for the regional economy – equivalent to over £1,500 per smoker who quits.

- 9.7 The NHS offers a range of services and NRT to help people quit smoking. Current data from national NHS allocations estimates that £24.5m is spent supporting 124,000 people to quit smoking in the short term (four weeks), equivalent to £198 per quitter. (This £24.5m also includes money allocated to tobacco control.)
- 9.8 It is also estimated that the costs of providing support and to a long-term quitter (52 weeks) are roughly double the short term figure, equivalent to £395. It is further estimated that a long-term quitter would, on average, use £320 of NHS-provided NRT over the 52 weeks.
- 9.9 This means that, *through the most expensive method of helping a smoker to quit*, the total cost of producing a long-term quitter is a maximum of £715.16. However, due to economies of scale when supporting a large number of people who are attempting to quit smoking, this figure may be reduced by up to £200 per smoker.
- 9.10 If every smoker who gave up did so by using the most expensive, intensive level of support and NRT available from the NHS, the net gain to the local economy would be a minimum of around £800 per smoker in the year during which support and NRT are provided.**
- 9.11 Clearly, the NHS does not have the capacity to give this level of support to all smokers who want to quit – but not all smokers will need this level of support.
- 9.12 This report has shown that smoking prevalence is higher among certain demographic groups. If a strategy to reduce the number of smokers in key groups is implemented, then the overall impacts of NHS resources and a reduction in the number of smoker in the region are potentially even more significant. We conclude this report with a recommendation for a targeted campaign focused on changing opinion and behaviour among employers (and the consequently the workforce) and suggest how the WMPHG and partners might further the health of the region and improve the quality of data and understanding of the tobacco economy.

## **10. Recommendations**

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- 10.1 The analysis in this report has helped to understand the cost to the regional economy of smoking, not only in terms of treating people who suffer ill health and require treatment, but also in respect of the knock-on effects to business and the wider population.
- 10.2 In developing a better understanding of the relationship between smoking and economic health, and in designing strategies and action plans to reduce the number of smokers in the region, we recommend attention is paid to three key issues.

### **Data**

- 10.3 Although analysis in this report used data from a wide range of sources, several key statistics are based on national rates applied to the regional populations. Original designs for the research framework included more sources of local data – most noticeably, the West Midlands Lifestyle Survey.
- 10.4 However, the researchers and project steering group felt that the response rate of the 2001 Lifestyle Survey was insufficient to produce statistically reliable data, with clear examples of bias in terms of ethnicity, for example. In addition, data from the 1995 Lifestyle Survey was not available due to problems in locating relevant files after a relocation of the archives. While the data itself may have passed its ‘sell by’ date for current modelling, such a survey would have helped to identify any potential differences that exist between the profiles of West Midlands smokers and those at national level.
- 10.5 It is our recommendation, therefore, that the WMPHG and partners design a programme of research (primarily using the Lifestyle Survey as the main tool of collection) to fill the gaps in regional knowledge on certain health issues. Any data collection methodology should ensure that there is a sufficiently large sample size and consequent response rate (and hence budget and resources) to produce data that is statistically robust at both regional and local authority level and that can provide reliable breakdowns by demographic characteristics (such as age, gender and ethnicity).

- 10.6 In addition, the WMPHG and public health partners across the region should develop a system of improving the quality and range of data attached to the Hospital Episode Statistics. While the model used in this report has estimated the proportion of patients requiring hospital treatment for smoking-related diseases who were actually smokers, this data was recorded at source (from the patient) in only a small minority of cases. If this information was captured as a matter of course (alongside other behavioural characteristics and demographic data) – while maintaining patient confidentiality – then the quality of data, and hence our understanding of the true costs and economic consequences of smoking, would be vastly improved.
- 10.7 This study has also highlighted the difficulties involved in marrying workforce data (categorised by Standard Occupational Classifications – SOCs) to smoking prevalence data (categorised by the newer National Statistics Socio-Economic Classifications – NS-SECs). It is our recommendation that further research be carried out to map (or produce a 'best-fit' model of) NS-SEC classifications to SOC codes and economic inactivity categories (such as 'long-term unemployed' or 'never worked'). This would allow smoking prevalence rates to be given to individual SOC codes and would therefore increase the accuracy in calculating the likely costs of smoking to businesses and hence the regional economy.

### **Targeting**

- 10.8 This report has shown that, on average, helping someone to stop smoking yields a gain of about £1,500 to the local economy per year. However, the demographics of the smoking population suggest that prevalence rates and/or the total number of smokers are particularly high for certain groups in the West Midlands. In terms of targeting anti-smoking policies in the region, the following observations should be borne in mind:
- In terms of gender, **men** are more likely to smoke (and more likely to quit) than women.
  - People aged **20-34 years** have the highest smoking rates of all age groups.
  - **Young women aged 16-19** and **men aged 20-34** have the highest rates of smoking among all age and gender groups.
  - The highest absolute number of smokers in the West Midlands is in the **35-49 year** age bracket for both men and women. Smokers are more likely to start quitting in this age group.

- Those in **routine and manual occupations** have the highest rates of smoking among the working population.
- Households in the West Midlands who fall within the **lowest income decile** (income lower than £114 per week) spend the highest proportion of their disposable income on tobacco.
- 20% of boys and 26% of girls **aged 15** are regular smokers. Prevalence rates increase sharply from children aged 13 (6%) to those aged 14 (16%).

10.9 Targeting these groups will produce a higher percentage reduction in the total number of smokers. And due to the age of smokers in the majority of key groups, targeting will also return the highest economic impact over the long-term. In addition, action must be taken to change young people's perceptions of smoking – from an activity linked to adult behaviour, to an addiction that is socially and personally unacceptable. Helping parents to stop smoking is a key driver in lowering smoking prevalence rates among young people.

10.10 It should also be recognised that, while the direct costs to the NHS of treating smokers is substantial, 69% of the total cost to the West Midlands economy is borne by **businesses**. It is therefore recommended that the WMPHG and partners produce promotional material to target businesses in the region. This should spell out the economic impacts and business benefits of implementing a 'no smoking' policy in the workplace. Switching employers on to the potential gains to 'the bottom line' is arguably the most powerful tool at the disposal of those concerned with improving the health of the region's people and economy.

### **Setting the standard**

10.11 It is in the workplace that the WMPHG and partners should aim to be the flag bearers. The health sector directly employs around 7% of the region's workforce (around 150,000 staff), and while smoking rates may be lower among these employees compared with other sectors, the NHS should implement a 'no smoking' policy that covers its own staff and visitors and that is enforced both within buildings and on grounds that are owned, run and managed by the health service.

10.12 In theory, policies are already in place to cover some aspects of NHS operations – but there are gaps. The WMPHG and partners must ensure that existing policies are tightened (and enforced) and expanded to cover all aspects of employment and activity.

- 10.13 If the public sector is serious in calling for a ban on smoking in public places, it should be seen to be the champion of such a cause and lead by example. The economic impacts and benefits are clear.
- 10.14 Finally, the findings from this initial study need to be shared and discussed much more widely within the health service. In addition, the early modelling work that has begun here needs to be built upon and improved, not least by creating more reliable primary data sources upon which to base estimates of the economic impacts of tobacco control measures.

## 11. Appendix A

11.1 Table 24 below shows the complete list of smoking-related diseases used in this research, the estimated percentage of patients suffering from each condition who are likely to be smokers or ex-smokers and the resulting probability that a patient suffering from a given condition is a smoker or ex-smoker in each case.

**Table 24 Smoking-related diseases and assigned probabilities**

Smoking-related disease	Band	Percentage of patients who are smokers	Assigned probability patient is a smoker
Malignant neoplasm of base of tongue	1	75%-100%	0.875
Malignant neoplasm of bronchus and lung	1	75%-100%	0.875
Malignant neoplasm of gum	1	75%-100%	0.875
Malignant neoplasm of hypopharynx	1	75%-100%	0.875
Malignant neoplasm of larynx	1	75%-100%	0.875
Malignant neoplasm of lip	1	75%-100%	0.875
Malignant neoplasm of nasopharynx	1	75%-100%	0.875
Malignant neoplasm of oesophagus	1	75%-100%	0.875
Malignant neoplasm of oropharynx	1	75%-100%	0.875
Malignant neoplasm of palate	1	75%-100%	0.875
Malignant neoplasm of trachea	1	75%-100%	0.875
Duodenal ulcer	2	50%-75%	0.625
Gastric ulcer	2	50%-75%	0.625
Insulin-dependent diabetes mellitus	2	50%-75%	0.625
Intracerebral haemorrhage	2	50%-75%	0.625
Malignant neoplasm of floor of mouth	2	50%-75%	0.625
Malignant neoplasm of other and unspecified parts of mouth	2	50%-75%	0.625
Malignant neoplasm of other and unspecified parts of tongue	2	50%-75%	0.625
Acute myocardial infarction	3	25%-50%	0.375
Angina pectoris	3	25%-50%	0.375
Asthma	3	25%-50%	0.375
Atherosclerosis	3	25%-50%	0.375
Atrial fibrillation and flutter	3	25%-50%	0.375
Atrioventricular and left bundle-branch block	3	25%-50%	0.375
Cerebral infarction	3	25%-50%	0.375
Certain current complication follow acute myocardial infarction	3	25%-50%	0.375
Chronic ischaemic heart disease	3	25%-50%	0.375
Essential (primary) hypertension	3	25%-50%	0.375
Malignant neoplasm of bladder	3	25%-50%	0.375
Malignant neoplasm of kidney, except renal pelvis	3	25%-50%	0.375
Malignant neoplasm of pancreas	3	25%-50%	0.375
Malignant neoplasm of parotid gland	3	25%-50%	0.375
Malignant neoplasm of pyriform sinus	3	25%-50%	0.375
Malignant neoplasm of stomach	3	25%-50%	0.375
Malignant neoplasm of tonsil	3	25%-50%	0.375
Malignant neoplasm of other & unspecified major saliva glands	3	25%-50%	0.375

Smoking-related disease	Band	Percentage of patients who are smokers	Assigned probability patient is a smoker
Myeloid leukaemia	3	25%-50%	0.375
Non-insulin-dependent diabetes mellitus	3	25%-50%	0.375
Occlusion/stenosis precerebral arts not result cerebral infarction	3	25%-50%	0.375
Occlusion/stenosis cerebral arts not result cerebral infarction	3	25%-50%	0.375
Other acute ischaemic heart diseases	3	25%-50%	0.375
Other cerebrovascular diseases	3	25%-50%	0.375
Other chronic obstructive pulmonary disease	3	25%-50%	0.375
Other disorders of urinary system	3	25%-50%	0.375
Other nontraumatic intracranial haemorrhage	3	25%-50%	0.375
Other peripheral vascular diseases	3	25%-50%	0.375
Pain in throat and chest	3	25%-50%	0.375
Sequelae of cerebrovascular disease	3	25%-50%	0.375
Stroke, not specified as haemorrhage or infarction	3	25%-50%	0.375
Heart failure	4	Average rate	0.27
Inguinal hernia	4	Average rate	0.27
Malignant neoplasm other ill-defined sites lip/oral cavity/pharynx	4	Average rate	0.27
Subarachnoid haemorrhage	4	Average rate	0.27
Subsequent myocardial infarction	4	Average rate	0.27

11.2 Table 25 below compares the model used in this study with figures given in the Health Education Authority's 1995 study, The Smoking Epidemic. The table shows all diseases where categories are the same in both studies (both studies include diseases which are not present in the other – see above table and HEA report for detail).

11.3 The table shows that where direct comparisons can be drawn, the model used in this study is comparable to figures used in the 1995 HEA report.

**Table 25 Diseases caused by smoking: HEA comparison**

Age range	The Smoking Epidemic, HEA, 1995*						UKRP model
	35-44	45-54	55-64	65-74	75+	Average**	All
<b>Cancer</b>							
Lung	91	90	90	90	89	90.0	87.5
Oesophagus	68	69	71	71	70	69.8	87.5
Bladder	47	47	48	49	47	47.6	37.5
Kidney	43	42	42	41	39	41.4	37.5
Stomach	34	35	36	36	35	35.2	37.5
Pancreas	29	25	24	21	17	23.2	37.5
Myeloid leukaemia	17	18	19	20	19	18.6	37.5
Unspecified site	27	34	37	37	31	33.2	27.0
<b>Circulatory</b>							
Ischaemic heart disease	56	54	40	26	11	37.4	37.5
Myocardial degeneration	30	27	27	25	22	26.2	27.0
<b>Digestive</b>							
Ulcer of stomach + duodenum	56	53	52	49	45	51.0	62.5

Source: *The UK Smoking Epidemic: Deaths in 1995*, Health Education Authority, Christine Callum, 1995

\* The HEA study figures are the estimated number of deaths caused by smoking as a percentage of all deaths from that disease and age at death in UK, 1995

\*\* Averages in the table are the averages of **rates** across all age groups given and not the overall average percentage of diseases caused by smoking (as the number of cases within in each age group is not given)

## **12. Appendix B**

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12.1 Appendix B describes the methodology used in constructing an estimate of the costs to businesses in the West Midlands of staff taking a break during working hours to smoke.

### **Methodology**

12.2 Table 27 and Table 28 below show the average distribution of smoked cigarettes during the working day for men and women respectively. Data cells in the tables that contain a '1' denote that a cigarette smoked in the allotted amount of time is considered as smoked in work time and hence will require a break from production.

12.3 This model also makes a number of other assumptions:

- Men smoke 15 cigarettes per day, women smoke 13.<sup>22</sup>
- A uniform distribution of smoking throughout the day, implying men will smoke, on average, one cigarette every 1hr 4mins 0secs and women one every 1hr 13mins 51secs.
- On average, each worker gets up at 7am and goes to bed at 11pm.
- Some 'bunching' of cigarette smoking. If a time zone overlaps with the beginning or end of the working day, it is assumed that the smoker will choose to smoke the cigarette outside work hours.
- Each worker is entitled to a lunch break, during which a cigarette smoked is not counted as being 'on work time'.
- Full-time workers work eight hours per day, part-time workers work four hours per day.
- It makes no difference to the number of cigarettes smoked during the working day if full-time/part-time workers work eight hour/four hour shifts that start at some other hour other than 9am (the same number of time zones and 'bunching' opportunities exist).

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<sup>22</sup> General Household Survey 2001.

- 12.4 The model also assumes that each worker receives four weeks holiday and does not work on the eight bank and public holidays given in England and Wales. This implies that workers who smoke will do so on 233 working days each year.

**Table 26 Number of working days in a calendar year**

Total days	Work days	Holiday	Bank & Public holidays	Total days at work
365	261	20	8	233

- 12.5 It is also assumed that each cigarette break takes five minutes.

**Table 27 Distribution of cigarette during day for men**

Time	No. of cigarettes	Cigarettes smoked by workers during working hours	
		Full-time	Part-time
07:00:00	All		
08:04:00	1	0	0
09:08:00	1	0	0
10:12:00	1	1	1
11:16:00	1	1	1
12:20:00	1	1	1
13:24:00	1	0	0
14:28:00	1	1	0
15:32:00	1	1	0
16:36:00	1	1	0
17:40:00	1	0	0
18:44:00	1	0	0
19:48:00	1	0	0
20:52:00	1	0	0
21:56:00	1	0	0
23:00:00	1	0	0

**Table 28 Distribution of cigarette during day for women**

Time	No. of cigarettes	Cigarettes smoked by workers during working hours	
		Full-time	Part-time
07:00:00	All		
08:13:51	1	0	0
09:27:42	1	0	0
10:41:33	1	1	1
11:55:24	1	1	1
13:09:15	1	0	0
14:23:06	1	1	0
15:36:57	1	1	0
16:50:48	1	1	0
18:04:39	1	0	0
19:18:30	1	0	0
20:32:21	1	0	0
21:46:12	1	0	0
23:00:03	1	0	0