

Health and Safety Executive Board**HSE/ 12 /64**

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Occupational cancer, priorities for future intervention – supplementary paper**Purpose of the paper**

1. This paper provides supplementary information on HSEs approach to its work on occupational cancer. Information on the mix of interventions and resources currently deployed to tackle each of the priority agents/occupations is given together with options for future cost-effective activities.

Background

2. At the Board meeting in December 2011, Dr Lesley Rushton gave an update on the Burden of Cancer Study. The Board discussed the implications of Dr Rushton's work for HSEs current and future activity on occupational cancer at its May 2012 meeting (see HSE/12/36). At this meeting the Board asked for further details on the scale of activities involved in delivering interventions on occupational cancer and the resources deployed.

ArgumentLong latency disease and cancer

3. Currently, occupational ill-health accounts for over 20 million working days lost and an estimated 12, 000 deaths per year. HSE is committed to reducing these numbers and a range of activities have been put into place to do this, including interventions with industry stakeholders, targeted inspection initiatives and awareness raising initiatives.
4. The major ill-health component is occupational cancer accounting for approximately 8000 deaths and a further 14, 000 cancer registrations annually. The Cancer Burden Study conducted by Dr Lesley Rushton provides an updated estimate of the current burden of occupational cancer in Great Britain due to past exposures and explores the future cancer burden due to occupation. Results of this study have helped HSE to develop priorities for future activity. The development of these priorities were discussed in the previous Board paper, HSE/12/36.

Achieving change in the workplace

5. The approach to tackling occupational cancer for each of the top 10 priority agents/occupations is based upon HSEs intervention strategy enabling us to identify those levers on which focusing our efforts will have the most impact (see HSC/05/65, www.hse.gov.uk/aboutus/meetings/hscarchive/2005/060905/c65.pdf).

To deliver the appropriate interventions we draw upon those best placed to take action using Sector, FOD and policy resource from within HSE. Integrated intervention plans are used to deliver our work e.g. Construction Divisions Working Well Together initiative to deliver messages on respirable crystalline silica.

6. **Annex 1** provides details of the interventions currently used for each priority agent/occupation. The intervention mix differs for each priority agent/occupation and reflects our current understanding of the exposed population and level of engagement with the industry stakeholders. For those priorities that are well understood the interventions draw on a sustained programme of activity spanning many years e.g. asbestos and respirable crystalline silica. For other priorities, our activity focuses on developing understanding of current exposures and working with and through other stakeholders e.g. shift work and diesel engine exhaust emissions.
7. Options for future activities are also discussed in **annex 1** together with details of the regulatory framework, current cancer burden and exposure profile.
8. HSE's role in occupational health issues, as in safety issues, can only be that of a catalyst to bring about improvements, with the primary role resting with others. Securing the contribution of all relevant sectors, key players and partners will deliver further beneficial interventions on occupational disease including occupational cancers. We therefore suggest holding a workshop in 2012/3 to explore what others could do, seek their commitment and address current concerns from a variety of organisations.

Resources

9. Costs relating to delivering specific interventions on occupational cancer are included in **Annex 1** for each agent/occupation. The costs include those associated with producing communication tools (e.g. vocational learning packages) and undertaking specific research projects to develop suitable interventions (e.g. understanding attitudes of tradespeople that shaped the design of the asbestos "Hidden Killer" campaign) and address knowledge gaps emerging from the cancer burden work (e.g. lack of exposure data). **Annex 2** provides a summary of the different interventions HSE makes to seek to maintain and improve standards of occupational health more generally.
10. Overall funding for health-based research is around £7million per year. Projects related to occupational cancer have cost £5 million during the 2009/10 and 2011/12 work years and include some substantial studies that are now complete e.g. the Cancer Burden Study (at a cost of £750,000).
11. Delivering the proposed stakeholder workshop (para 8) on occupational disease will cost approximately £30,000 – £50,000.

Action

12. The Board is invited to consider:

- a. How HSE may engage constructively with more partners to deliver future beneficial interventions
- b. Whether more work should be done on diesel engine exhaust emissions and with painters to seek opportunities to raise awareness through others while we develop a better understanding of current exposure scenarios
- c. That in the case of shift work, HSE should explore avenues for possible future interventions while we await the results of research on the role of shift work and the development of breast cancer
- d. Whether HSE continues to progress and develop its partnership work on asbestos, respirable crystalline silica and welding
- e. That in the case of tetrachloro-ethylene and polycyclic aromatic hydrocarbons HSE should maintain its current low level of activity and continue to support those organisations who lead on radon and solar radiation
- f. Whether it would be supportive of a workshop/conference with partners to explore what more they could do on occupational disease

Paper clearance

13. Cleared by SMT on 1st August 2012.

Annex 1

Asbestos

Cancer site

1. Mesothelioma, lung, larynx, stomach

Profile

2. Available information shows:
 - a. High numbers of deaths based upon 2005 data (3, 909). Many deaths arise from exposure in industries and activities that no longer exist. A quarter of all deaths are amongst tradespeople.
 - b. Current exposure risk relates to the disturbance of *in situ* asbestos containing materials.
 - c. High number (1.8 million) of tradespeople are still at risk
 - d. Strong evidence of a causal link.
 - e. Evidence that awareness of risk is low and that interventions can be successful in raising awareness.

Regulatory framework

3. Asbestos is subject to legislative control through the Control of Asbestos Regulations 2012. These regulations contain provisions for those who have responsibility for maintenance of non-domestic premises through "Duty to manage", and to employers in relation to licensable work, notification of some non-licensed work, effective controls and training provision.

Intervention mix

4. HSE has worked with organisations to help them raise awareness or develop their own effective and proportionate guidelines for their particular business sectors. Examples include work with:
 - a. Trade associations such as the Scottish and Northern Ireland Plumbing Employer's Association and supply side companies, such as Wolseley, to help them develop their own communication strategies and initiatives.
 - b. The Association of British Insurers (ABI) to help it develop guidance for its members and the contractors they employ on how to deal with asbestos when dealing with domestic and other emergencies.
 - c. Electricity/gas supply companies to help them develop work methodologies for contractors who will be involved in the forthcoming 'smart meter' replacement scheme (in a number of properties, existing meters are mounted on asbestos backing boards).
5. HSE has also developed a number of significant awareness raising initiatives:
 - a. Hidden Killer – an HSE run campaign in 2008 - 2010 to raise awareness of asbestos among tradespeople carrying out maintenance and construction jobs to inform them of why asbestos can be an issue in their work; educate them on the need to be properly trained/informed on what to do; and encourage them to seek more information on working with asbestos. HSE is

currently seeking approval for funding to rerun part of this exercise in 2012/13.

- b. Training Pledge – an initiative run with industry training providers in 2011 to promote behaviour change by increasing access to training for tradespeople most at risk. Training providers were invited to pledge and deliver free hours of asbestos awareness training. All the major trade associations representing training providers participated.
 - c. Asbestos learning package - an interactive 45 minute lesson aimed at young trade apprentices in the 16-19 age group. Designed to be delivered by college lecturers etc. to apprentices to provide them with a basic introduction to asbestos and the risks it can present during work.
 - d. Retail interventions – undertaking awareness raising activities with retail companies on their duty to manage for asbestos removal during refurbishment of retail stores. This builds upon a recent high profile prosecution of a major national retailer for poor management of risk from asbestos.
6. Activity by others such as national mesothelioma day, the British Lung Foundation's "Take 5 and stay alive" campaign aimed at DIY enthusiasts (see www.take5andstayalive.com) also contribute towards increasing general awareness of the risk associated with asbestos exposure.
7. HSE is also undertaking research on the asbestos lung burden in workers born after 1965 and who started work after 1980. This work will be used to determine (1) the asbestos exposure due to current working conditions, (2) which occupational groups are most at risk, (3) an estimate of future mesothelioma risks due to current and environmental exposure and (4) indicate whether UK and EU regulations minimize the hazard. A research project looking at ill-health in the British construction industry will also consider asbestos.

Resources

8. Significant resource demands relate to enforcement and large scale media campaigns. HSE continues to undertake inspection activity on asbestos with respiratory disease being priority topic for Construction Division. Since 2009/10 HSE has issued over 300 notices year on year and are taking around 20 successful prosecutions per year including recent prosecutions of a major national retailer and a school in Dorset. The "Hidden Killer" campaigns cost in the region of £1 million each.
9. Costs relating to the research project on asbestos exposure in workers born after 1965 total £88K. For costs of the construction industry project see overarching research (page 22).

Future options

10. HSE can:
 - Re-run the training Pledge initiative.
 - Consider further "Hidden Killer" campaigns, although this would be subject to a significant approval process via DWP and Cabinet Office.

- Look for further opportunities to work with Trade Associations and equipment suppliers as these are identified.
- Continue enforcement activity.
- Explore future opportunities to raise awareness through the DoH's Responsibility Deal Health at work construction sub-group (see <http://www.responsibilitydeal.dh.gov.uk/pledges/>).

Case study

11. **Asbestos training pledge:** In 2011 HSE developed an Asbestos Training Pledge initiative in partnership with industry training providers to promote behaviour change by increasing access to training for those trades people who are most at risk. The initiative invited training providers to pledge and deliver free hours of asbestos awareness training. The original target of 4,000 hours of free classroom based training was pledged and a further 4,000 hours of free online courses, a target chosen to reflect the estimated number of people who die each year from asbestos-related disease. This target was exceeded – a total of 13,557 hours of free training was pledged, which equated to offers of free training for 4,020 at-risk tradespeople.
12. In total 10,308 hours of free training were actually taken up and 3,197 tradespeople received free asbestos awareness training. All 3 major trade associations representing training providers participated in the initiative, as did a number of independent companies.

Shift work

Cancer site:

13. Breast

Profile

14. Available information shows:

- High numbers of deaths based upon 2005 figures (552).
- High numbers of workers, 5 – 20% of UK working population is engaged in shift work that involves night work. This equates to 3-6 million workers.
- Weak evidence of causal links/links not confirmed.

Regulatory framework

15. The Working Time Regulations provide rules on shift working and night time working. With respect to shift work and occupational cancer, the current degree of scientific/medical knowledge provides no clear basis for formal enforcement activity .

16. From 2009 the Danish government consider compensation for women who have worked night shifts at least once a week for at least 20 - 30 years and where there are no other significant risk factors. To date some 110 cases of breast cancer have been considered eligible for compensation.

Intervention mix

17. HSE has commissioned the University of Oxford to undertake an extensive study on the relationship between shift work and chronic disease. The Cancer Epidemiology Unit at the University of Oxford will use data from two existing studies, the “Million Women Study” and “EPIC-OXFORD” to investigate the disruption of circadian rhythms, with a focus on shift working patterns and ‘lifestyle’ behaviours in relation to cancer and other chronic conditions in women and men. The study is due to be completed in December 2015. The results of this study will be considered together with new emerging international research.

18. Options for evidence-based preventative actions were considered in the recent workshop of international scientists in Copenhagen in October 2011. The workshop concluded that current scientific knowledge was insufficient to provide specific recommendations to regulate shift working and current evidence from the epidemiological studies did not suggest the need to revise the IARC classification of shift work.

19. HSE has reviewed its current guidance: HSG 256 Managing Shift Work: Health and Safety Guidance and considers that it remains appropriate at present to enable employers to meet their current legal obligations relating to hours of work and how they are scheduled.

20. Health considerations around shift work are also being discussed by a working group set up under the Department of Health’s Responsibility Deal Pledge on Health at Work, see <http://responsibilitydeal.dh.gov.uk/>

Resources

21. The research project has been a significant undertaking, costing £529k.

Future options

22. This issue is complex and it is not clear what role shift work and/or other lifestyle behaviours play in the development of breast cancer. Tackling this priority will require a concerted cross-government approach. HSE can:

- Highlight this issue with key industry bodies.
- Open discussions with DWP, BIS and DoH to explore surrounding issues and look for opportunities to raise awareness in the future such as the DoH's Responsibility Deal (see <http://www.responsibilitydeal.dh.gov.uk/pledges/>).

Respirable Crystalline Silica (RCS)

Cancer site

23. Lung

Profile

24. Available information shows:

- Significant exposure to RCS can cause silicosis and lung cancer.
- The current burden estimated in the cancer burden report is almost 800 annual lung cancer deaths.
- Construction is a key sector accounting for over 600 of the annual lung cancer deaths from RCS exposure.

Regulatory framework

25. RCS is subject to the Control of Substances Hazardous to Health Regulations (2002) as amended. COSHH requires that exposure is prevented or where this is not practicable, adequately controlled. A Workplace Exposure Limit (WEL) value of 0.1 mg/m^3 (8h TWA) is in place. RCS is a candidate substance being considered as part of an EC instigated review of the Carcinogens and Mutagens Directive (2004/37/EC) for which we expect a proposal to emerge in 2013.

Intervention mix

26. HSE provides a comprehensive range of task-specific advice and guidance on preventing exposure to RCS through the COSHH Essentials sheets.

27. Intervention activity is designed and delivered through partnership groups composed of trade associations, professional organisations, suppliers and vocational training organisations that represent the cross section of industries where risks from exposure to silica are present. The interventions include:

- a. Development of a training tool, the "Dust Tool Box Talk" to raise awareness amongst quarry operatives/maintenance personnel. The tool was trialled in April 2012 and H&S reps and union reps will be encouraged to deliver the tool on site. The final version of the tool will be available for download at www.safequarry.com
- b. Adding modules on 'silica dust' and 'controlling exposure' in Safety and Health Awareness Days (SHADs) run by quarry partnership team members and the Mineral Products Association (MPA).
- c. Development of a vocational learning package for new-entrant stoneworkers.
- d. Delivering 3 SHADs for stoneworkers, 2 to be run jointly with Stonefed and the dimension stone industry in the autumn 2012.
- e. Delivering 2 SHADs for foundry workers, run jointly with the Cast Metals Federation.
- f. Through the Construction Partnership Team IOSH are conducting a survey amongst its construction members to obtain levels of awareness and knowledge of the use of on-tool extraction methods.
- g. Hire Association Europe (HAE) developing a leaflet outlining the dangers of dust. The leaflet will be given out with every piece of

- equipment they hire out. This initiative will target suppliers and end users.
- h. Extending the Construction Dust Partnership by setting up six working groups to look at developing targeted messages for employers and putting information on to a website. The working groups are led by members other than HSE and messages will focus on educating workers to better understand the dangers of dusts through to exposure controls.
 - i. ARCO championing face-fit testing. Adding sections on health risks from dusts including RCS to the CITB-Construction Skills' Health, safety and environment tests. This will act to raise standards across the industry – see <http://www.cskills.org/supportbusiness/healthandsafety/Health-Safety-Environment-Test/index.aspx>.
 - j. Developing a pilot SHAD on dust-specific issues. The pilot will run alongside those delivered by the Working Well Together campaign that include information on silica exposure.
 - k. Developing standards for on-tool extraction with the hire industry and tool manufacturers. The standards are expected to be published by the end of 2012.
28. HSE is also undertaking a number of research projects to better understand and reduce RCS exposure. These include:
- a. Task specific sampling for RCS exposure in foundries – evaluating the practicability of a number of different samplers for silica dust in the workplace.
 - b. An overview of ill-health in the construction industry – silica is one part of this broad research project – see overarching research (page 22).
 - c. As part of a wider strategic research programme on health:
 - o RCS surveys in brick manufacture and foundries
 - o Exposome – looking at the feasibility of biological monitoring and measuring RCS in exhaled breath collected from foundry workers.
 - o Development of an 'effective control' benchmarking tool for managing exposure to silica dust
29. A project to better understand RCS exposures relating to cutting roof tiles showed that high RCS levels were generated. These results have been presented to industry representatives who agreed that no dry cutting should take place from later this year.

Resources

30. Intervention costs relating to partnership work activities have mainly been borne by the industry partners. Costs for the stoneworkers SHAD are £6k and for the foundry workers £4k.
31. HSE continues to take enforcement activity on RCS. In the last 2 years over 200 notices have been served on RCS related issues. Respiratory disease is a priority topic for Construction Division and projects where respiratory risks are more prevalent are targeted such as the refurbishment project where nearly 3,900 visits were carried out during 2011/12. Further training for inspectors is planned for the autumn 2012.

32. Research costs for specific projects on silica total £114k, with additional resource drawn from the wider project on ill-health in the British construction industry (overall cost of £261k) and the strategic research programme on health (overall cost of £4.24 million).

Future options

33. HSE can:
- a. Fully engage in EU discussions on the possible inclusion of RCS within the Carcinogens and Mutagens Directive, to get practicable and proportionate results.
 - b. Consider lowering the WEL. This will form part of the wider EU discussion on RCS. However, this is a complex issue and discussions on lowering the WEL will need to take account of wide variations across the sectors in terms of compliance levels, use of control methods and issues around the practicality of measuring RCS at lower levels. The Future Cancer Burdens work has considered a range of exposure scenarios for RCS and the affect they would have on the future cancer burden. Results show that increasing compliance with the current WEL will have a greater impact than lowering the limit.
 - c. Look for future opportunities to raise awareness through the DoH's Responsibility Deal Health at Work construction sub-group (see <http://www.responsibilitydeal.dh.gov.uk/pledges/>).

Case study

34. **Reducing respiratory disease in kerb, paving and block cutting:** Workers within the construction sector undertaking kerb, paving and block cutting activities are known to have an increased risk of occupational disease resulting from exposure to silica. Building on a sustained programme of activity, spanning a number of years HSE set up a supply chain initiative to raise awareness of the ill-health effects of RCS exposure and affect behavioural change. The initiative included representatives from the construction industry, manufacturers, hire companies and associations, local authorities, highways agency, subject experts and training bodies. Together the group identified a range of practical interventions and took the lead on their implementation. A wide range of activities were taken forward including:
- Research into improved equipment design
 - Development of a range of communications tools e.g. DVDs, leaflets and paver markers, news articles, training materials, case studies, on-site promotion via the Highways Agency safety training vehicle
 - Industry approval for the specification of plastic kerbs in appropriate projects
 - Client and contractor safety briefings, site instruction and inductions on best practice
 - Web hosting of materials
35. The adopted approach generated leverage within the supply chain for example, enabling access to the Highways Agency's supply chain partners who recognised that this impacted on other building sector work that they were undertaking. A survey of stakeholders and an

independent evaluation of the initiative by the Institute for Employment Studies showed that:

- The risks of silica exposure were well understood and awareness of HSEs work in this area was high.
 - Suppliers were stocking water suppression equipment and dust extractors.
 - Cutting without water was becoming less common.
36. Trials using plastic kerbs were well received and becoming a standard consideration at the design stage.

Welding

Cancer site:

37. Lung

Profile

38. Available information shows:

- Numbers of deaths based upon 2005 data (152).
- Numbers of workers exposed > 75, 000.
- Welders spread across many industries and present in large and very small businesses.
- Welding fume is variable in its composition. Depending on the type of welding being performed the resulting fume is a complex mixture of gases and salts, including metals such as chromium and nickel and other compounds. Some of the constituents have Workplace Exposure Limits assigned and have been classified as carcinogens.

Regulatory framework

39. Welding fume is subject to the Control of Substances Hazardous to Health Regulations (2002) as amended. COSHH requires that exposure is prevented or where this is not practicable, adequately controlled.

Intervention mix

40. A comprehensive range of task-specific advice and guidance is provided by HSE in the COSHH Essentials sheets. Intervention activity is designed and delivered through a partnership group composed of trade associations, professional organisations, suppliers and vocational training organisations that represent the cross section of industries where welding is present. These organisations include, the Association of Welding Distributors, Unite, AWFTE - the training and education association and The Welding Institute. The partnership group :

- Has developed a vocational learning package for welders. Roll-out of the package will be done by members during 2012/13.
- Is developing a work plan to deliver messages on risks and control measures to employers and employees.
- Will deliver 4 SHADs in 2012/13.
- Is developing an independent website for the industry on the health effects from and control of exposures in welding.

Resources

41. HSEs costs for this work are:

- Development of the vocational learning package, £25K.
- Delivery of the SHADs - £8k for 4 events.

Future options

42. HSE can:

- Target the supply chain as a route to deliver messages on substitution and/or suitable controls.
- Develop links with the higher / further education sector to formally include occupational ill-health on the curriculum.

Painters

Cancer site

43. Lung, bladder.

Profile

44. Available information shows:
- a. Numbers of deaths based upon 2005 figures (334).
 - b. Potentially large numbers of workers exposed, many within SMEs and linked to construction, vehicle spray painters and workers in paint manufacture.
 - c. Causal agents not identified. Painters are exposed to a wide range of substances including solvents, additives and pigments as well as materials containing asbestos and silica through their work in and on buildings. There is insufficient information available to identify which particular agents cause the reported excess lung or bladder cancers.
 - d. Paint technology has changed over the last 20 years with a move to water based paints, micro-encapsulation of pigments, use of new thinners and restrictions on putting hazardous materials on the market relating to dyes and pigments via the Marketing and Use Directive and more recently REACH regulation.
 - e. Exposure patterns are not well understood.

Regulatory framework

45. Control of Substances Hazardous to Health Regulations (2002) as amended and the Construction (Design and Management) Regulations 2007 apply to this activity.

Intervention mix

46. HSE has not undertaken any targeted interventions with this group on occupational cancer. Advice on health issues are provided through HSEs attendance at the Painters and Decorators show and through articles in trade magazines used by small businesses and trades people. We are also working with the construction industry to encourage better use of established published guidance and are conducting an evaluation of historical and current exposures to hazardous substances and their control in the British construction industry. The exposure of painters to hazardous substances and changes in application technology (i.e. moving from traditional brush and roller application to spray painting) is one part of this project - see overarching research.

Resources

47. Costs incurred relate to the research project – see overarching research (page 22).

Future options

48. HSE could await the results of the research project (due autumn 2013) and availability of better evidence generally before undertaking any activity, or in the interim:
- Look for future opportunities to raise awareness through the DoH's Responsibility Deal Health at Work construction sub-group (see <http://www.responsibilitydeal.dh.gov.uk/pledges/>).

- Use existing partnership networks such those for asbestos and construction to engage with relevant industry bodies to:
 - Find out more about the work undertaken by painters and the exposures they encounter.
 - Raise awareness of good general working practice.
 - Develop an understanding of what further action may be practicable.

Diesel Engine Exhaust Emissions (DEEEs)

Cancer site

49. Lung, bladder.

Profile

50. Available information shows:
 - a. High numbers of deaths based on 2005 figures (625).
 - b. Estimated > 10, 000 workers exposed.
 - c. Environmental exposure is a contribution to the exposure burden.
 - d. IARC have recently (June 2012) classified DEEEs as carcinogenic to humans.
 - e. DEEEs are a complex mixture of particulates, gases and vapours which occur when diesel fuelled engines operate. No Workplace Exposure Limit (WEL) has been set for DEEEs as a whole as there are insufficient data to establish a clear, reliable threshold for all potential health effects. None of the constituents are considered suitable as a marker for DEEE exposure, although some do have specific WELs. Available evidence suggests that polycyclic aromatic hydrocarbons (PAHs) may be the causal link.
 - f. The major source of workplace exposure to DEEEs is from emissions from heavy vehicles that use diesel fuel. Emissions are also generated from stationary power sources which may be used regularly in tunnelling, mining or on construction sites.
 - g. HSE surveys in 1994/5 and 2006 found that individual DEEE constituents with an occupational exposure limit were well below the limit in a range of workplaces including bus garages, roll on roll off ferries and tollbooths.
 - h. Professional drivers are estimated to be the biggest worker group at risk from exposure to DEEEs.
 - i. The effect of recent improvements to modern engine design on exposure levels is currently unknown by HSE/HSL.

Regulatory framework

51. DEEEs are not a supplied substance and therefore are not classified under the EU Regulation on Classification, Labelling and Packaging of Substances and Mixtures (CLP Regulation), however, they are subject to the Control of Substances Hazardous to Health (Amended) Regulations 2002. COSHH requires that exposure is prevented or where this is not practicable, adequately controlled.
52. DEEEs are a candidate substance being considered a part of the EC instigated review of the Carcinogens and Mutagens Directive (2004/37/EC) for which HSE expects a formal EU proposal in 2013.

Intervention mix

53. HSE provides guidance for employers on DEEEs Control of Diesel Engine Exhaust Emissions in the Workplace, which provides examples of good working practice for controlling exposure in specific situations (see <http://www.hse.gov.uk/pubns/books/hsg187.htm>) and guidance is also available for employees (see www.hse.gov.uk/pubns/indg286.htm). HSE is also undertaking further research that will provide current

exposure information on DEEEs within the British construction industry (due autumn 2013 -see over-arching research page 22).

Resources

54. Significant costs relate to the research project – see over-arching research (page 22).

Future options

55. HSE can:
 - a. Fully engage in EU discussions on the inclusion of DEEEs within the Carcinogens and Mutagens Directive, to get practicable and proportionate results. Further legislative action is not considered to be practicable given the difficulty around measurement.
 - b. Engage with relevant industry bodies to raise awareness of good working practice and develop an understanding of what further action may be practicable.
 - c. Open discussions with DfT, DEFRA and DoH to explore:
 - the impact of environmental exposure, particularly in relation to the exposure of professional drivers.
 - the impact of new vehicle design and potential for further improvements.
 - seek further potential routes to raise awareness, for example, DoH's Responsibility Deal and its pledge on occupational health (see <http://www.responsibilitydeal.dh.gov.uk/pledges/>).

Solar radiation

Cancer site

56. Non-melanoma skin cancer (NMSC).

Profile

57. Available information shows:

- Very low numbers of deaths based upon 2005 figures (12).
- High numbers of people develop NMSC, however, this cancer is more amenable to treatment.
- Not primarily an occupational issue.

Regulatory framework

58. The Management of Health and Safety at Work Regulations 1999 requirement to undertake a suitable and sufficient risk assessment.

Intervention mix

59. Preventing sun exposure is primarily a public health issue with other organisations best placed to deliver messages on this. For example, cancer-based charities run campaigns on sun protection issues aimed at the general population that create a broad general awareness. Cancer Research UK's SunSmart campaign (see www.sunsmart.org.uk) provides information on protection and risk factors as well as campaign materials such as posters, postcards, leaflets and booklets and local initiatives. The National Institute for Clinical Excellence also provides resources through its Pathways initiative for the NHS and local authorities on the design and implementation of public health information on preventing skin cancer. These resources highlight the importance of addressing occupational exposure when designing public health initiatives. See www.nice.org.uk/guidance/PH32

60. Currently HSE is supporting the IOSH funded SunSafe project, which is working to change construction workers group behaviour and reduce exposure to solar radiation. The project has launched a DVD-based intervention delivering key sun protection messages to this high risk group during 2012 (see www.youtube.com/watch?v=Lc5xzNQmqQY). An evaluation of the success of this project in terms of changes in workers' knowledge, attitudes and behaviours is planned for 2012/13.

Resources

61. HSE has not provided any financial resource towards the IOSH SunSafe project.

Future options

62. HSE considers that future proactive work is most cost-effectively delivered through others with HSE supporting the work through the provision of information on occupational exposures and risks.

Polycyclic Aromatic Hydrocarbons (PAH, Coal tars and pitches)

Cancer site

63. Non-melanoma skin cancer (NMSC).

Profile

64. Available information shows:

- Very low numbers of cancer deaths based upon 2005 figures (11).
- There are 545 cancer registrations per year, however this cancer is more amenable to treatment.
- No evidence of significant exposure. An HSE survey in 2006 of PAH exposure did not find evidence of significant exposure other than at sites undertaking timber impregnation – this process has now ceased.
- Substitutes are available.

Regulatory framework

65. PAH's are classified under the European Regulation on Classification, Labelling and Packaging of Substances and Mixtures (EC1272/2008) and the Control of Substances Hazardous to Health (amended) Regulations 2002 require that exposure is prevented, or where this is not practicable, adequately controlled.
A biological monitoring guidance value of 4 µmol 1-hydroxypyrene/mol creatinine in urine is in place.

Intervention mix

66. This hazard has effectively disappeared and consequently HSE is not undertaking any intervention activity. However, HSE is evaluating historical and current exposures to hazardous substances and their controls in the British construction industry. This evaluation covers many substances of which one is coal tars (see overarching research page 22).

Resources

67. Costs incurred relate to the research project – see overarching research (page 22).

Future options

68. HSE considers that it is not cost-effective to pursue any further activity for this group of substances.

Tetrachloro-ethylene

Cancer site

69. Cervix, non-Hodgkin lymphoma, oesophagus.

Profile

70. Available information shows:

- Number of cancer deaths based upon 2005 figures (140).
- Main source of potential exposure is the dry-cleaning industry, the design of modern and more efficient dry cleaning machinery and advances in both technology and garment care have contributed to reducing exposures. There is some limited use in the manufacturing industry as a degreasing agent, however this is within closed systems.
- The causal link between tetrachloro-ethylene and cancer at these sites is unclear.
- The majority of dry cleaners are enforced by HSE, but in some cases there is LA enforcement for local operational reasons.

Regulatory framework

71. Tetrachloro-ethylene is subject to the Control of Substances Hazardous to Health Regulations (2002).

Workplace Exposure Limit values of 345 mg/m³ (8h time weighted average) and 689 mg/m³ (short-term, 15 minute) are in place.

Intervention mix

72. No recent interventions have been undertaken.

Resources

73. No exceptional costs have been incurred.

Future options

74. To undertake a low-cost awareness raising activity with the large national dry-cleaning companies.

Radon

Cancer site

75. Lung.

Profile

76. Available information shows:

- Number of cancer deaths based upon 2005 figures (184).
- Not primarily an occupational issue with exposure delineated geographically rather than by particular occupation or industry.
- Other Government departments led as the focus is on public health issues in areas where radon is found and may seep into peoples homes. Interventions have been delivered in the main by the Health Protection Agency (HPA).

Regulatory framework

77. Control of radon exposure in the workplace is provided by the Ionising Radiation Regulations 1999.

Intervention mix

78. The HPA takes the lead on radon and provides information on risks and measuring for both the domestic and workplace settings through a dedicated website, www.ukradon.org. HSE and local authorities are engaged in activities with the HPA and others to raise awareness, improve education and take action where inappropriate management of radon risks in the workplace have been identified. HSE have:

- a. Provided advice during general inspections, conducted targeted inspections in high risk radon areas and produced guidance for employers, see www.hse.gov.uk/radiation/ionising/radon.htm
- b. Supported a HPA initiative assessing radon levels in schools that provides a mechanism for HSE to take action where appropriate.
- c. Contributed to a DCLG consultation on building regulations to ensure that new builds, including workplaces, have effective control measures in place e.g. under-floor sumps and extraction fans.
- d. Begun to work with other government departments on UK Radon Action Plan for the revised EU Directive on Basic Safety Standards for Radiation Protection.

Resources

79. Interventions on radon have been delivered through normal business activity with no exceptional costs incurred.

Future activity

80. HSE considers that future proactive work on radon is most cost-effectively delivered through others with HSE providing a supporting role.

Overarching research

The cost of occupational cancer

81. HSE is currently working on two strands of research to develop a robust cost estimate for occupational cancer.

(1) A pilot study by Newcastle University to obtain evidence on whether individuals consider the human cost of cancer greater than other risks. By comparing cancer with road related risk, the pilot study is investigating how dread and latency associated with cancer affects people's concern about it, relative to road risk. It is hoped that the study will provide a defensible empirical basis for establishing the human cost of fatal cancer. The pilot is expected to be completed by late summer 2012 and HSE is contributing half of the cost of this work, £10k with the Office for Nuclear Regulation contributing the remainder.

It is possible that the pilot concludes that a full study is necessary. This would take around a year to deliver.

(2) "Costs to Britain Model" HSE economists and statisticians are exploring how to adapt the 'Costs to Britain Model' to estimate the total cost for fatal and non-fatal cancers. The results of the Newcastle University work will enable us to select an appropriate value for the 'human costs' part of total costs of cancers. Total costs also include all the financial costs associated with cancer, including lost income, employer costs, Government costs (such as NHS treatment costs). At this stage we can say that the current total cost of occupational cancer is expected to represent a cost to society in the order of 'double figure' billions.

Transfer of technical knowledge to HSE project extension

82. A small project to transfer the technical knowledge of the cancer burdens method from Imperial College has been commissioned. This will allow HSE to revise estimates of occupational cancer in light of new exposure and risk information and to assess the potential impact of intervention scenarios in-house in the future. The project is expected to deliver in October 2012 and will cost £24K.

Occupational exposure data in the construction industry

83. An evaluation of historical and current exposure to hazardous substances and their control in the British construction industry. This evaluation will include the current exposure information available for asbestos, silica, DEEEs, coal tars, wood dust and painters. Due to be completed in autumn 2013 at a cost of £261k.

The HARM index

84. HSE/HSL statisticians and economists are exploring the development of an index of HARM for all occupational health diseases including cancer. The HARM index will consider various work-related ill health and injury outcomes, which take into account factors such as severity, age at onset, and duration of the condition to estimate the burden of 'harm' or work-related ill health and injury in Great Britain based on current occupational exposure.

Occupational CARcinogen Exposure data for Great Britain (Carex-GB)

85. The lack of comprehensive GB specific exposure data is a significant cause of uncertainty in the cancer burden estimates and HSE's knowledge of the overall prevalence of workplace exposure to carcinogens. The exposure data used in the cancer burden estimates came primarily from CAREX, a database that provides estimates of exposed populations in European countries based on exposure data from Finland and the US from 1990 – 1993. HSE is in the process of commissioning work to develop a national information system that can gather and evaluate the best available data on occupational exposure to known carcinogens in GB workplaces. The information collected will form a strong evidence base to guide target interventions and to monitor progress in prevention and controlling occupational exposure carcinogens. This work is not yet underway with HSE currently exploring delivery through HSL. No costs are available yet.

Annex 2

HSE's interventions to maintain standards of and achieve improvements in occupational health

Strategic approach

1. HSE's Strategy¹ sets out the mix of interventions it uses ranging from developing policy; carrying out inspection, investigation and enforcement; licensing or approving hazardous processes and substances after assessment; undertaking research; and informing and advising employers, workers and the public. It emphasises that HSE can only achieve the goals of less deaths, serious ill-health and injury by stimulating higher levels of leadership, ownership, commitment and competence to influence people to be more effective at managing and controlling the serious risks that they create and by harnessing the efforts of all the stakeholders in the system. HSE therefore devotes resources to stimulating and building this wider capacity as well as to its other statutory functions.

Inspection, investigation and enforcement outside the major hazard sectors

2. HSE's Field Operations Directorate (FOD) targets high risk sectors and poor performers (irrespective of sector) in relation to occupational ill-health in the same way and with the similar intervention techniques that it tackles safety. Some of the most severe health risks can occur in the construction industry through the exposure to asbestos, silica and other dusts, and the nature of some physical tasks (i.e. the risk of MSDs). HSE operates a statutory scheme for licensing and paying a follow-up visit to asbestos contractors to better control exposure risks. Asbestos and other respiratory diseases are priority at all construction site visits. There are approximately 140 regulatory construction inspectors visiting sites on a day-to-day basis. Asbestos and respiratory diseases are key themes in the work that Construction Division is carrying out through the CONIAC Health Working Group to engage with and influence how larger construction companies manage occupational health. It is also commissioning toolkits (i.e. awareness and educational packages) with specific sections on key health risks that can be used more widely through the industry.

3. Construction aside, the main processes on which effort is focussed include asbestos and silica exposure found outside of construction, MVR², other dusts (e.g. wood, flour, from surface engineering etc), welding fumes, semi-conductors, electro-plating, various agents which cause dermatitis and MSDs. Where poor conditions are found and the health risks and the control measures are well known, regulatory inspectors, as in construction, will take action immediately themselves. There are approximately 300 (FTE) regulatory inspectors carrying out both safety and health interventions of this type, in addition to construction inspectors, with approximately 20% of the effort devoted to specific occupational health issues where both safety and health

¹ The Health and Safety of Great Britain – Be part of the solution

² Motor vehicle repair

Board1 (01.10)

issues are often dealt with in the same intervention the effort cannot be disaggregated.

4. Where further expertise is required to diagnose the nature or extent of a risk or the best means of control or to better secure enforcement, regulatory inspectors (including construction inspectors) call upon HSE's field and HQ occupational health specialists. These include occupational health inspectors, industrial hygienists, radiation specialists, ergonomists, epidemiologists, ergonomists, noise and vibration specialists and doctors. There are approximately 70 such specialists in the field and a further 10 at HQ whose time is fully devoted to occupational health issues. Where more extensive sampling, analysis or forensic investigation is required, experts at HSL are called upon.

The major hazard sectors

5. There are two types of intervention HSE uses in these sectors. First, where the hazard itself will cause immediate, serious and/or widespread ill-health or death, HSE operates assessment, licensing and frequent inspection regimes in order to help prevent these low probability, high consequence events. One of the main aims of the nuclear regime, for example, is to prevent the release of and exposure of workers and the public to, unsafe levels of radiation. There are currently approximately 200 nuclear inspectors. Exposure dose monitoring also takes place for radiation workers. Similarly, the biological major hazard regime operates to the same purpose in relation dangerous biological agents. There are approximately 15 specialist biological inspectors.

6. Secondly, some of the same hazards exist in the high hazard industries that occur in wider industry and similar intervention techniques are used, for example, health risks in the offshore sector include exposure to asbestos, ionising radiation, welding fume and diesel engine exhaust and programmes of inspection and engagement with the industry and trade unions on improving the control of these risks. HID uses approximately 5 to 10 inspector years on these and similar programmes in the on-shore petro-chemical (CoMAH), mining and explosives sectors.

The regulation of chemicals

7. HSE, through its Chemical Regulation Directorate (CRD) is the UK competent authority for a number of EU chemical regulatory regimes which have the objectives, amongst others, of ensuring a high level of protection of human health (and of animals and the environment). The principle mechanisms to achieve this (depending on the regime) are; identification and communication of hazardous properties and risks, restricting the use of substances and authorising the sale and use of only those products which pass a risk assessment scheme. The risk posed to those working with chemicals is a key consideration in all of these regimes and overall the objective is stop substances being produced, marketed and used in ways that are detrimental to health.

The principle schemes are:

- European Regulation (EC) 1272/2008 on Classification, Labelling and Packaging (CLP) of Substances and Mixtures requiring manufacturers, importers and users of substances and mixtures to classify them before placing them on the market and for those classified as hazardous to specify information to be supplied with the product and appropriate labelling. HSE contributes to this work through membership of ECHA's expert scientific committees, developing proposals for specific substances and contributing to the development of criteria and guidance for identifying and assessing hazardous properties (including carcinogens) and to the development of improved test methods (including those that minimise the use of laboratory animals). The scope of a number of other downstream EU regulations is influenced by the established classification.;
- EU Regulation 1907/2006 for Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). This requires that all chemicals manufactured or imported at more than 1 tonne per year are registered with ECHA. Registration is being carried out in phases to 2018. It includes provisions for making information available within the supply chain through chemical safety assessments and reports and safety data sheets, application of risk reduction measures by downstream users, authorisation to control 'substances of very high concern' and restrictions to address risks on an EU wide basis. HSE contributes to the operation of REACH through membership of ECHA's expert scientific committees, carrying out substance evaluations, acting as one of the UK enforcing authorities and supporting Defra who hold the policy lead. The option is available to propose restrictions on the marketing and/or use of substances that pose significant health risks across the EU to either workers or consumers;
- European Regulation (EC) 1107/2009 for plant protection products (essentially agricultural pesticides). This requires that active substances are first approved at the EU level before Member States can authorise individual products. A key part of the required risk assessment relates to carcinogenicity. Products are not authorised if exposure as a result of the proposed use is estimated to exceed reference doses ('safe' exposure levels) for acute, medium and long term exposures for consumers, operators and bystanders. HSE contributes to the EU evaluation process and carries out the risk assessment and authorisation procedure for products to be marketed and used in the UK. HSE also does a significant proportion of policy development and implementation work on behalf of the lead Department, Defra, and is an enforcing authority;

For pesticides the controls are supplemented by Directive 2009/128/EC for sustainable use which requires amongst other things that professional users are trained and certificated and that spray equipment is periodically tested;

- For biocides (non-agricultural pesticides), Directive 98/8/EC applies similar controls to those for plant protection products. It is being replaced in September 2012 by EU Regulation 528/2012, again with similar controls. HSE's functions are also similar to those for plant protection products although for biocides DWP Ministers hold the policy lead.
8. HSE devotes approximately 210 staff to chemical regulation of the type described above, together with managing an R&D budget for pesticides on behalf of Defra. Most of the cost of this effort is borne by industry or Defra.

Building a wider capacity to control the risks

9. As well as direct interventions in workplaces, processes and substances, HSE invests resources (approximately 30 staff years) across general industry (and central and local government and the NHS where appropriate) and the major hazard sectors to work with employers and trade union groups and their representative bodies, nationally and regionally in order to achieve a much larger 'gearing' effect. This involves engagement at different levels from working with major companies, e.g. the CONIAC Health Working Group; influencing the supply chain (e.g. to reduce the source of dusts etc); running Safety and Health Awareness Days (SHADs) directly with companies, trade unions and workers (e.g. on welding, for foundry workers and for stoneworkers etc); the production of educational and awareness material; and seeking to create self-sustaining groups on a local basis, e.g. the Working Well Together and Estates Excellence partnerships.

Developing Awareness

10. As Annex 1 notes, HSE has devoted resources in the past to running awareness campaigns in the media specifically targeted at those who may be exposed to certain occupational health risks, e.g. the "Hidden Killer" campaign aimed at raising awareness of asbestos and other exposures. A further intervention on asbestos is planned.

Policy, Research and Analysis

11. These areas of activity are covered in the preceding Annex. Excluding pesticides policy carried out on behalf of Defra, HSE devotes about 25 staff years to policy development on occupational ill-health which is supported by contributions from statisticians and economists (approximately an additional 10 staff years), HSE's Corporate Medical Unit and research and data collection programmes at HSL and elsewhere.

Conclusion

12. HSE's approach to improving standards of occupational ill-health is to intervene in a range of appropriate ways, at different levels depending on the nature, severity and extent of the risk. It seeks to lead and harness the efforts of all the stakeholders in the system in order to achieve a greatly magnified effect from resources which will always be limited.