Health Protection Agency

Chemical Hazard and Poisons Report

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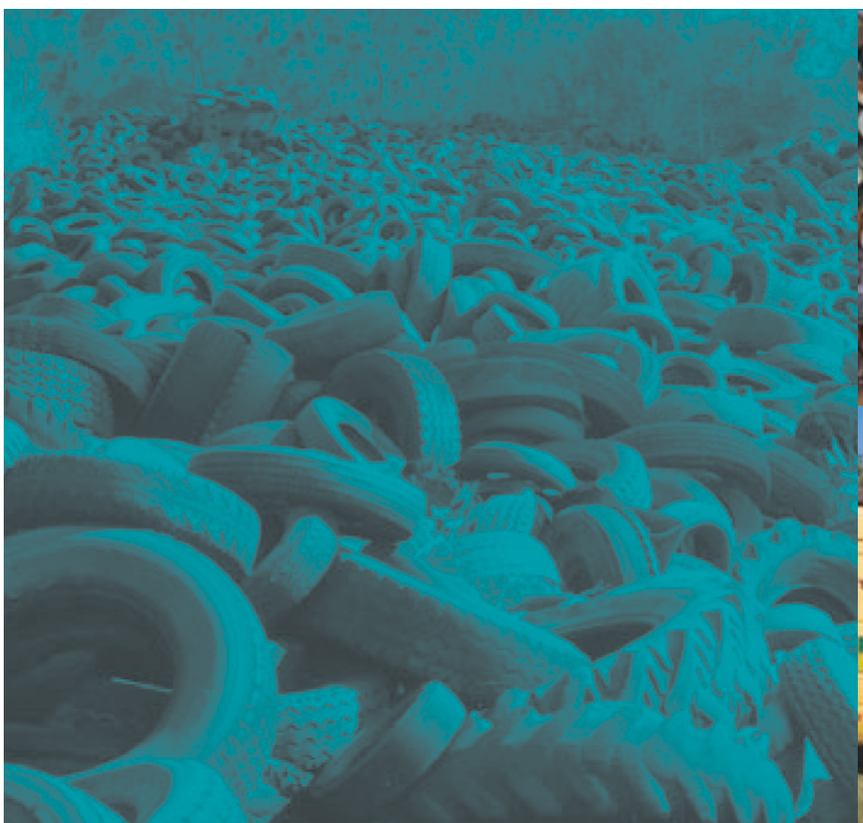

Chemical Hazards and Poisons Report Editorial

Dr Virginia Murray, Editor

This is the first Chemical Hazards and Poisons Report. It is written for all our colleagues in the Health Protection Agency who are involved in chemical incident response and preparedness. it is also designed to be helpful to other health and emergency service colleagues who work with us in addressing so many of these issues.

In this first issue we introduce the staff of our Chemical Hazards and Poison Division and we highlight the following:

- Incident management and investigation remains topical and often problematic for health and emergency professionals. The problems posed by car tyres, shoreline contamination and thunderstorm asthma are discussed.
- developments in emergency preparedness are continuing with the Fire and Rescue Services New Dimension equipment. Concern about risks to Accident and Emergency Departments include a new approach to prevent contamination until ready to receive casualties and how to manage the wearing of chemical personal protection.

The Chemical Hazards and Poisons Report has an Editorial Board. This includes David Russell, Pat Saunders, Ovnair Sepai as representatives of the Chemical Hazards and Poisons Division with Rachel Heathcock, interim representative of the Local and Regional Services and Nick Edwards, interim representative of the National Poisons Information Service. We look forward to receiving material for review and publication.

Contents

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Chemical Hazards and Poisons Division

Professor Stephen Palmer

Stephen is Mansel Talbot Professor of Epidemiology and Public Health at the University of Wales College of Medicine and has been appointed Director of the Chemical Hazards and Poisons Division (CHaPD).
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Stephen and the whole of CHaPD are enthusiastic to take forward the Health Protection Agency (HPA) chemicals and poisons agenda as agreed by the Chief Medical Officer's Getting Ahead of the Curve report (2002). The tasks outlined for CHaPD are in the HPA Corporate Plan (http://www.hpa.org.uk/hpa/publications/corporateplan2003_8.pdf). In particular the following selected Strategic Goals point to some of the areas of work for CHaPD.

These are:

- To anticipate and prevent the adverse effects of acute and chronic exposure to hazardous chemicals and other poisons
- To identify, prepare and respond to new and emerging diseases and threats
- To identify and develop appropriate responses to childhood diseases ssociated with infection, chemical or radiation hazards
- To strengthen information and communications systems for identifying and tracking diseases and exposure to infections and chemical and radiological hazards

The CHaPD is located in Birmingham, Cardiff, London and Newcastle and the following summarises our teams:

Chemical Hazards and Poisons Division, Birmingham

The Birmingham Centre of the Division is based in the Public Health Building at the University of Birmingham; part of a public health community involving the Institute of Occupational Health, Division of Environmental Health and Risk Management, West Midlands Cancer Intelligence Unit and the National Centre for Horizon Scanning. The community has active and highly regarded research, teaching and laboratory facilities which the unit is able to use and contribute to, maximising collaboration, effectiveness and efficiency.

Patrick Saunders

Pat is the head of the Birmingham Centre of the Chemical Hazards and Poisons Division and Regional Environmental Health Adviser for the West Midlands region.
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Andrew Kibble

Andrew is the Deputy Head of the Birmingham Centre of the Chemical Hazards and Poisons Division. He is responsible for the day-to-day management of chemical incidents and IPPC. He provides advice on issues relating to environmental health and toxicology.
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John is a Chemical Response Officer specialising in toxicology. He also manage the West Midlands Surveillance System for Chemical Incidents, and is responsible for the web presence of the Division.
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Professor Roy M. Harrison

Roy is the Professor of Environmental Health and Head of Division of Environmental Health and Risk Management, University of Birmingham. He has a major research interest in environmental chemistry and health. Roy is a member of several national and international advisory groups and is a consultant to the CHaPD.
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Chemical Hazards and Poisons Division, Cardiff

The Cardiff centre of the Chemical Hazards and Poisons Division is based at the University of Wales Institute, Cardiff and is collaborating with the National Poisons Information Service based at Cardiff and Vale NHS Trust. The Unit offers expert and authoritative advice on the public heath impact of chemical and environmental hazards and individual clinical poisonings. A brief resume of staff members is shown below.

Professor Gary Coleman

Gary Coleman is the Interim Deputy Director of CHaPD, the Head of the Cardiff Unit and the Director of the WHO Collaborating Centre for the Public Health Management of Chemical Incidents.
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Dr David Russell

David is a Consultant in Environmental Toxicology. He has a background in chemical pathology and has developed an interest in contaminated land, personal protective clothing and decontamination
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Dr Roger Pullin

Roger is a Scientific Officer currently undertaking IPPC health effects assessment reviews and providing environmental health advice regarding the management of acute & chronic issues of chemicals in the environment.
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Jeff is an environmental scientist currently undertaking IPPC health effects assessment reviews and providing environmental health advice regarding the management of acute & chronic issues of chemicals in the environ-ment.
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Peter is a Principal Environmental Health Advisor currently managing IPPC health effects assessment reviews and providing environmental health advice regarding the management of acute & chronic issues of chemicals in the environment, which includes training issues.
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Mrs Sue Burke

Sue currently works as part of the administration team, carrying out the daily administration of the office, assisting in the organisation of the Department's conference and maintenance of the Departments Web Site.
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Mr Edwin Huckle

Edwin provides administrative and technical support to the Unit, carrying out the daily administration of the National Surveillance project and assisting in the organisation of the forthcoming Conference in December 2003.
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Miss Deborah Purnell

Deborah currently works as part of the administration team and her role includes daily administration, maintaining the accounts and record keeping and the co-ordination of the international aspect of the Department.
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Other staff associated with Chemical Hazards and Poisons Division, Cardiff are:

Professor Philip Routledge

Phil Routledge is Director of the National Poisons Information Service (Cardiff) and Head of Department of Pharmacology, Therapeutics and Toxicology at UWCM.
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Dr John Thompson

John is a senior lecturer in Clinical Pharmacology at the University of Wales College Medicine and Honorary Consultant at Cardiff and Vale NHS Trust.
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Professor Malcolm Lewis

Malcolm Lewis is a clinical pharmacologist who provides expert advice to the division in Cardiff on matters related to clinical pharmacology and toxicology.
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Dr Dennis D'Auria & Dr Michael Glenn

Dennis D'Aura and Michael Glenn have both recently been appointed as consultants by Cardiff and Vale NHS Trust and will provide expert and authoritative advice on environmental and occupational medical issues

Chemical Hazards and Poisons Division, London

The London centre of the Division is located with the Medical Toxicology Unit at Guy's and St Thomas Hospital NHS Trust. We link closely to the National Poisons Information Service, London, and the clinical facilities, library and laboratories. We have close links to the clinical resources of this major teaching hospital and we work with the London School of Hygiene and Tropical Medicine, Kings College, Imperial College, University of Surrey and a wide range of other academic facilities around the country. We also link to many other agencies and organisations in the UK and abroad.

Dr Virginia Murray

Virginia is a Medical Toxicology Consultant and has extensive experience in incident response and provides the chemical of CBRN support. She has worked at the unit for over 20 years.
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Dr Jackie Spiby

Jackie is our Environmental Public Health Consultant. She leads on inequalities and long term hazards. She is also working with Local and Regional Services for training in non-infectious environmental hazards.
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Dr Giovanni Leonardi

Giovanni is our Consultant Environmental Epidemiologist who providing surveillance and epidemiological support as well as consultant cover for the on-call rota.
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Dr Simon Clarke

Simon is a Consultant in Emergency Medicine with an interest in toxicology.
He is helping to promote links between emergency services (prehospital through to critical care and acute medical teams) and emergency planning teams.
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Robie Kamanyrie

Robie is our senior toxicology information scientist at CPHD(L). He provides acute and chronic medical toxicology advice for incident response and on-going chemical contamination issues. He has worked with the unit for ten years.
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Nannerl Herriott

Nannerl is our environmental epidemiologist. Besides chemical incident support she provides environmental epidemiology help during or following chemical incidents.
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Mathew Drinkwater

Matthew is an environmental scientist. He provides technical advise for incident response and land contamination and is responsible for the coordination of the unit's Integrated Pollution Prevention and Control activities.
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Charlotte Grey

Charlotte is an environmental scientist who will provide technical advice for incident response, land contamination and IPPC
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Richard Mohan

Richard is on a 4 year Engineering Doctorate student with us and Surrey and Brunel Universities, part funded by EPRSC. His research involves using atmospheric dispersion models and GIS to link pollution, population and health data. Richard.mohan@hpa.org.uk

David Gelb

David is Business and Training Coordinator until the end of 2003. He has recently graduated from the University of Nottingham with a BSc in Mathematics.
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Amber Groves

Amber Groves is the Secretary at CHaPD London. She has recently joined the team and has worked previously at the Home Office.
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Chemical Hazards and Poisons Division, Newcastle

Wolfson Unit

The Chemical Hazards and Poisons Division ((CHaPD) Newcastle) is now in the Wolfson Unit on the campus of Newcastle University. The Wolfson building provides laboratory, office and clinical facilities that are ideally suited to the developing work programme of the Newcastle Unit. It is also sited close to the offices of National Poisons Information Service, Newcastle so the two Divisional services are able to work more effectively together. The Wolfson building has been refurbished and in addition to the HPA Unit, accommodates the academic department of Environmental Medicine and Toxicology, facilitating collaboration in toxicology research between the HPA and the University.

In March 2004 a new five storey building, specifically designed to be environmentally friendly, will open and house Newcastle University's Environmental Research Institute. This will be a multidisciplinary research facility, housing soil and water scientists, environmental microbiologists and pollution biologists, and has purpose built laboratories for environmental toxicology research and analytical chemistry. CHaPD (Newcastle) will be able to collaborate directly with the research groups in the Environmental Research Institute on projects of joint interest and relevance to the HPA.

Professor Peter Blain

Peter is the Head of the Newcastle Unit. He is a medical toxicologist and a consultant general physician to Newcastle Hospitals NHS Trust
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Ovnair Sepai

Ovnair is the Senior Scientific Toxicologist.
Her background is in toxicological chemistry. Ovnair is currently on maternity leave having given birth to her daughter on 18 August.
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Margaret is a laboratory research technician. She works on several of the department's current research projects in toxicology.
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Faith is Professor of Toxicology with Newcastle University. She has an extensive background in toxicology research and is a Government adviser in toxicology.
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Dorothy is the Service Coordinator for the Unit. She has worked with Peter Blain for 13 years as his Personal Assistant.
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Mary Taylor

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Public Health and Environmental Risks associated with Tyre Fires

Photograph 1: Fire fighters in the process of putting out fire in part of the tyre dump, 19 February 2003 © David Walmsley, Environment Agency

Amanda Welsh[1], Dr Paul Crook[2] and Roger Harman[3]
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[2] SpR Public Health, London, on secondment to Division of Chemical Hazards and Poisons (London), Health Protection Agency
[3] Incident and Emergency Planning, Environment Agency

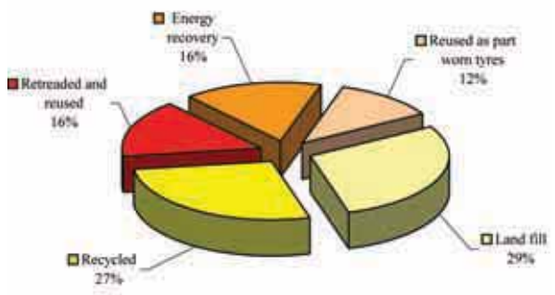
Introduction

In the UK more than 35 million tyres are manufactured each year and 134,000 tyres become worn out every day.[1,2] Forecasts estimate that the number of tyres in use will increase by up to 60% by the year 2021.[1,2]

The environmental impact of tyres is considerable. This relates to their manufacture, use and disposal. During the manufacture of one tyre, approximately 20 to 30 litres of oil is required and in the process volatile organic compounds (VOCs) are emitted.[3] It has been estimated that 53,000 tonnes of rubber is lost from tyres through abrasion with the road surface. Other pollutants such as polycyclic aromatic hydrocarbons (PAHs) and heavy metals are also released onto road surfaces.[3]

Figure 1 displays how waste tyres are managed. Although increasing amounts of tyres are retreaded and reused, or used to produce energy, significant amounts are legally and illegally dumped.[4] These dumped tyres may attract arsonists. This article describes the public health and environmental concerns relating to tyre fires.

Figure 1: Management of waste tyres (Wolfenden 2003)



Case study

A disused limestone quarry was part filled with an estimated 1.45 million tyres between the late 1970's and the early 1990's without adequate controls (photograph 1). This tyre dump now represents a very significant risk to both people in the vicinity and the environment if (when) it goes on fire. The operator was prosecuted, later declared bankrupt and subsequently vanished.

Three fire events, one in 1993 and two in 2003, were fortunately extinguished by the local fire brigade. However, the most recent fires, probably started by children, still both took over two days to extinguish despite only involving a few hundred tyres each (photograph 2).

Tyre fires are notoriously difficult to put out owing to their open structure (no shortage of air), heat retention allowing easy reignition and the fact that water is deflected off owing to their very shape. The only real solution is fire prevention in the first place. This should be coupled with adequate fire breaks between inLand fill dividual stacks to prevent fire 29% spread. If a fire occurs physical separation and extinguishment of individual tyres one by one must be undertaken.

This last action was done in the two 2003 fires. It can be highly damgerous and is aduous work.

Were a fire to become established in the main body of tyres in the quarry, it is probable that a nearby motorway will be shut very quickly (negligible visibility in thick black smoke); parts of the national grid will be shut down (to prevent arcing through the carbon smoke to the water jets in the hands of fire-fighters) and part of the national rail network would have to be closed for the same reason. A realistic estimate of fire-fighting duration would be measured in weeks rather than days for this site. It is also quite likely that the radiated heat from a fully developed fire would cause the quarry wall to fail (conversion of solid limestone to powdery lime) and could fracture a sizeable gas main and sever an A class road. In addition water run off from fire fighting could potentially cause approximately 100 years of water pollution from the tyre oil contaminating the local watercourse and a nearby aquifer.

Source:

Table 1: Tyre fires identified by a search of the literature

Location	Year	Duration (days)	Approx. no. of tyres	Incident Management	Adverse environmental effects	Cause
Rochdale, England [5]	1972 Apr 1975 July 1975	1 30 10	9,000	None reported	Water supply reservoir still closed	Arson suspected
Winchester, Virginia, USA [6]	1983	Blazed for 9 months, smouldered for a year and a half	6-9 million	None reported	800,000 gallons of pyrolytic oil reclaimed. Soil contamination to reported depth of 100ft. Smoke plume rose to 3,000ft and fallout reported in 3 states	Arson suspected
Selby, England [3]	1987	80	>1,000	None reported	21 gallons of oily leachate removed from site- drinking water intake closed for 2 days as precaution	Arson suspected
Powys, Wales [3]	1989	Still burning after 14 years	10 million	None reported	Monitoring of zinc, iron and phenol levels in nearby stream. Levels increase with rainfall. Thick black smoke releasing benzene, dioxins and particulates	Arson suspected
Hagersville Ontario, Canada [7]	Feb 1990	17	8 million	Long term monitoring ongoing	700,00 litres of run off oil into soil. Creek water contaminated (PAHs)	Arson suspected
Saint Amable, Quebec, Canada [7]	May 1990	3	No data available	150 people evacuated	Possible contamination of soil and water by oil released from the burning tyres	Arson a potential cause
York, England [8]	1991	No data available	> 1,000	None reported	Low levels of phenols entered local stream	No data available
Cornwall, England [9]	1992	1	No data available	None reported	Phenolics and PAHs detected in run off water	Arson suspected
Washington, Pennsylvania, USA 10	Feb 1997	14	1.7 million	Evacuation of 500 residents and closing of 2 schools	None reported	Arson suspected
Gila River Reservation, Arizona, USA [10]	Aug 1997	7	3 million (shredded)	Monitoring for ground contamination	None reported	Arson suspected
Cheshire, England [11]	1999	Not clear	500,000	None reported	Run off oil contaminating site	Arson suspected

5. Home Office and Scottish Office 1995,
6. Slaughter 1996
3. Ennvironment Agency 1998,
7. Hunt 1991'
8. ENDS 1991
9. ENDS 1992
10. Poole 1998
11. ENDS 1999

These expected potential domino effects are in addition to the impact on the local populations. Although the nearest sizeable residential and commercial areas are some distance from the site, they will undoubtedly be in range of the fallout of the smoke once it has lost its initial heat and therefore buoyancy. Would "Go in; Stay in; Tune in" be an adequate instruction to several thousand people if smoke is continuously generated for several weeks? (Photographs 2&3).

Literature search

A search of Environment Daily (ENDs) reports was conducted for tyre fires. A Google search was also conducted. Reports were only included if they contained details on the approximate number of tyres involved or the duration of the tyre fire (summarised in table 1).

Tyre fires

Tyres pose a significant risk to the environment. They are not biodegradable as the process of vulcanisation (treatment with sulphur to make tyres harder) prevents bacterial attack and therefore tyres remain permanently in the environment unless set alight.[12]

Tyre dumps attract vermin and the standing water from rain collected in the inner rim of the tyre provides an excellent breeding ground for mosquitoes e. g. Aedes aegypti a vector for dengue and yellow fever. [13] However, in the UK the major hazard of tyre dumps to public health relates to the toxic plumes of smoke released if they are set alight.

Tyres can be readily set alight deliberately. Arson is a common problem; the cause of over half of the fires reported in the UK. Motives for arson may be malicious and include revenge or racial attack, fraud, pyromania or boredom.[14]

Tyres contain highly combustible and pollutant materials (Table 2).

Table 2. Typical constituents of the rubber compound in tyres Source: Rapra Technology Limited, 1995

Constituent	% Weight
Rubber hydrocarbon (containing styrene and butadiene)	51
Carbon black	26
Oil	13
Zinc Oxide	2
Sulphur	1
Other chemicals such as heavy metals (including lead, arsenic and chromium)	7

Photograph 2: Extent of tyre load in quarry seen on 24 July 2003 © Virginia Murray, Chemical Hazards and Poisons Division (London)

Tyres are designed to absorb heat generated by friction with the road surface. The high carbon content and steel cords in the tyres act as a ' heat sink' and store the heat within the tyre. Therefore, once on fire, the tyre's ability to store heat is exploited and the fire is readily reignites.

The stages of tyre combustion are described in Table 3 .

Tyre fires result in the release of hazardous pollutants both into the atmosphere and into the ground (Box 1).

Table 3: Stages in tyre combustion. Source: Hazardous Materials-Managing the Incident, 1995

Stage of Combustion	Time	Fire progress with whole tyres	Fire progress with shredded tyres
Ignition/Propagation	0 to 5 minutes	Tyres give off flammable vapours at 538 °C (1000 °F). Individual tyres are burning.	Tyre shreds easily ignite: rapidly spreads to entire pile.
	15 to 30 minutes	Flames cover entire pile. They spread two square feet every second.	Fire spreads along pile extremely rapidly.
Compression	30 to 60 minutes	Heat and smoke levels increase dramatically. Top tyre layer collapses on itself. Visible flaming is reduced.	Hot coal bed in centre and a claylike ash crust on top of the pile. Similar to coal pile.
Equilibrium/Pyrolysis/ Smouldering	60 minutes +	Fuel consumption and heat production equalises.There is an increase in oil run off.	The clay like ash protects burning core from water penetration.

Photograph 3: Representatives of South Yorkshire Fire and Rescue Services, the Environment Agency, the Health Protection Unit and the Chemical Hazards and Poisons Division on site visit, 24 July 2003 © Virginia Murray, Division of Chemical Hazards and Poisons (London)

Box 1: Tyre fire pollutants

Atmospheric pollutants

- The thick black smoke containing many hazardous chemicals such as carbon monoxide and hydrogen cyanide as a result of incomplete combustion
- Dioxins, furans, PCBs, PAHs due to the com-bustion of benzene and chlorine in the tyres
- Particulate material.

Water and Land contamination

- During combustion heavy metals, phenolic compounds and PAHs leach out of the tyres. A significant amount of oil is liberated from each tyre during combustion
- These contaminants may leach into the ground or be washed into nearby watercourses by firefighting water3

Location of known tyre stockpiles

There are 44 known sites containing significant tyre stockpiles around the UK, the locations are shown in Figure 2.[3]

Prevention and control of the negative impact of tyre dumps

Measures to prevent and control the negative impact of tyre fires are shown in Box 2. These include broad measures to decrease tyre use; promotion of reuse and energy recovery; and specific measures at the site of tyre dumps, such as remediation, risk assessment and contingency planning in the event of a fire.

New Legislation

Following a European Union directive, recent legislation in the UK bans the disposal of most tyres in landfill sites. This came into force in July 2003

Box 2: Measures to minimise the negative impact of tyre fires

1. Action to reduce the number of used tyres

- Public education to ensure optimal tyre pressures and to encourage driver behaviour that decreases wear, e.g. slower speeds around corners.

2. Promotion of tyre reuse, recycling or energy re-covery

3. Local prevention of illegal tyre dumping

- Local identification of potential sites with increase security (CCTV, patrols etc) enforcement of penalties for fly tipping

4. Prevention and control of fires at existing tyre dumps

- Site remediation i.e. removal and proper disposal of the tyres
- Reduced site access through increased security for large dumps
- Obtain advice from fire services regarding use of fire breaks and consider water storage located nearby

5. Contingency planning for potential fires

- Robust multi-agency contingency plans in the event of a fire (including fire, ambulance, health services, the local authority and EA involvement).
- Plans should take into account likely local populations and infrastructure at risk e.g. rail, road, electricity.

Conclusion

Tyre fires have the potential to pose considerable risks to the environment and public health. Responsible agencies should ensure that these risks are identified and minimised by remediation and site control. Furthermore, multi-agency contingency plans need to be in place to deal with the potential fires.

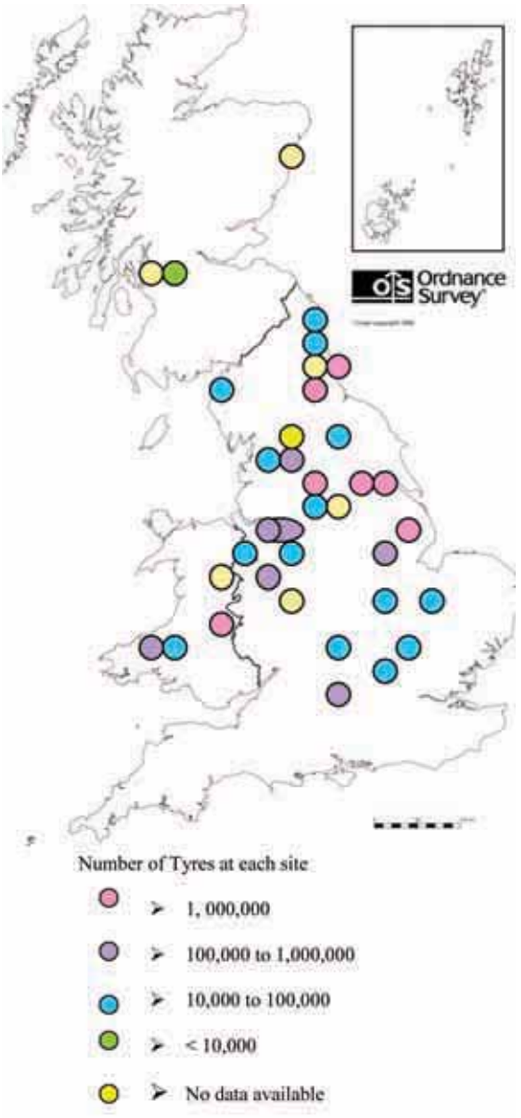


Figure 2: Locations and sizes of known tyre dumps in the United Kingdom (source: Scott, Crown Copyright)[15]

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Shoreline Contamination

Introduction

Dr Virginia Murray Consultant Medical Toxicologist Division of Chemical Hazards and Poisons Division (London)

Shoreline response can be difficult. The following articles highlight a number of key issues:

- 'Anthrax on the beaches' (pages 8–11) and two recent incidents reported to the Division of Chemical Hazards and Poisons (page 12) show the need for early collaborative response and appropriate product information and sampling.
- Considerable emergency planning has been undertaken in developing a procedure for dealing with potentially hazardous containers found on the Sussex coastline (page 13). I am very grateful to Dr David Hagen, Consultant in Communicable Disease Control, Sussex Health Protection Unit, and the Emergency Services Major Incident Working Group for sharing this checklist which may be helpful to others.
- Advisory Committee on Protection of the Sea (ACOPS) has been undertaking surveillance of packaged chemicals and other hazardous items for more than 20 years. Their work is summarised in pages 14-15

Photograph 1: sample of items found on the beach in January 2003 © Dorset Health Protection Unit

'Anthrax On The Beaches!!'

Chris Chambers, Interim Emergency Planning Lead, Dorset Health Protection Unit, Dr Sue Bennett, Consultant in Health Protection, Dorset Health Protection Unit, Keith Coles, Emergency Planning Officer, West Dorset District Council

Incident summary

Day 1

At 11:00 hours on Monday, 20 January 2003 West Dorset District Council received a call advising them that packages marked as "Anthrax" had been washed up on to the beaches at West Bay, Near Bridport in Dorset.

Senior Officers of the Council consulted the Council's Civil Emergency Plan. The Plan contained an extract from STOp Notice 5/98: A National Framework for Dealing with Hazardous Containers washed up on UK Coastline". Key extracts from the Plan were as follows:

- Dorset Fire and Rescue Service are the Lead Emergency Service advising on the safe disposal of hazardous and non-hazardous materials on the beach
- the Environment Agency advise on water quality issues
- West Dorset District Council have a small supply of overdrums for on site storage of material collected from the beaches
- Dorset Police and the Coastguard Agency provide support if requested
- as for all emergencies, the lead Emergency Service also leads on Press enquiries during the emergency stage

West Dorset District Council identified a number of urgent tasks:

- to send a Senior Officer to the scene to liaise with the Fire and Rescue Commander;
- to establish what the role of the District Council would be in collecting the material on the beach;
- to assess health and safety issues for the District Council's own operatives;

Photograph 2: Collection of some of the items found © Dorset Health Protection Unit

- the West Dorset District Council Press Officer to liaise with their counterpart in the Fire and Rescue Service;
  - to establish exactly what material is on the beach
  - to establish where it has come from, given that the polluter will be responsible for the clear up operation
- to contact the Dorset County Emergency Planning Officer to establish liaison routes.

The Senior Officer from the West Dorset District Council reported the following information on his arrival at the scene:

- members of the Dorset Fire and Rescue Service were at the scene and one of their Officers was directing the clean up operation;
- support was being provided from a Coastguard on the scene ;
- Police Officers were present to control public access to the beach;
- the Ambulance Service was on standby at the scene;
- an Environment Agency Chemist was also at the scene and undertaking analysis;
- the packages washing up on the shore included Anthrax vaccine;
- the Press were at the scene and included photographers;
- a warship had been sighted by several persons at Charmouth, close to West Bay, that weekend.

By 12:15 hours, the Dorset Health Protection Unit based at Ferndown, some 46 miles east of Bridport were alerted by the Emergency Planning Lead for Dorset County Council. A number of containers had washed up on either side of the Harbour at West Bay and these were marked "Anthrax vaccine". A senior Environmental Health Officer was reported to have been despatched to the scene.

At 12:25 hours the Dorset Health Protection Unit telephoned Dorset Police to check whether they were aware of the situation. The Dorset Health Protection Unit was informed that a similar incident had happened at Lyme Regis, further west along the Dorset coast on Sunday, 19 January 2003. A small number of vials marked "Anthrax vaccine" had been handed in by a sea angler and had been autoclaved at the nearby District Hospital at the request of the Police.

By 12:55 hours, the Environmental Health Officer at the scene telephoned the Dorset Health Protection Unit and was asked to describe the material that was being washed on to the beach. Apart from large numbers of vials marked "Anthrax vaccine" there were about 100 vials of brown liquid labelled Dimercaptopropanol. This had an expiry date of 1999 and the Anthrax vaccine had an expiry date of October 2002. The Environmental Health Officer was also able to supply batch numbers. During the course of the next hour, a series of telephone calls were made by staff of the Dorset
Health Protection Unit to share information with:

- the Regional Emergency Planning Adviser;
- the Chemical Incident Response Service;
- the Emergency Services;
- the West Dorset District and the Dorset County Councils.

CIRS advised that Anthrax vaccine would be harmless if contact was made with the skin but that dimercapto-propanol would be an irritant. This information was cascaded out to the services at the scene with a recommendation that light personal protective equipment should be worn by those engaged in the clear up operation.

Neighbouring Health Protection Units along the Coast were also alerted that material might wash up in their area and shortly after 14:00 hours, a telephone call was received from CIRS to say that the Anti-Terrorist Branch and the Maritime and Coastguard Agency had also been alerted.

At 14:30 hours, the Regional Health Emergency Planning Adviser (RHEPA) advised the Ambulance Service of the need for a Silver Command meeting and as the Police were not responding to the incident apart from creating an initial cordon, it was agreed with the Ambulance Service, that the Dorset Health Protection Unit would arrange the Silver Command meeting for
16:00 hours in the West Dorset District Council offices in Dorchester. At this meeting, the situation on the beaches was confirmed and it was agreed that the Dorset Fire and Rescue Service would issue a Press Release that evening. Materials from the beaches were to be collected and stored in the overdrums at the West Bay Council depot. Scientists from the Centre for Applied Microbiological Research were to be asked if any testing was needed. The Coastguard Agency was represented at the first Silver Command meeting through a telephone link but the MOD did not attend the first meeting.

By 17:20 hours, a telephone call was made from the RHEPA's team in Bristol to the Dorset Health Protection Unit Consultant attending the Silver Command meeting to say that the Anthrax vaccine had been confirmed by CAMR as having been issued to the Armed Services in 2001. A Naval source was suspected. The Head of the Anthrax Division of CAMR was also requesting further information on the labelling of the dimercaptopropanol vials.

At 18:30 hours, a visit was made by Dorset Health Protection Unit staff to the West Bay Council depot where material from the beaches was being stored. The following materials were identified and batch numbers, details of manufacturers and dates of expiry were recorded wherever possible:

- vials of Anthrax vaccine;
- vials of dimercaptopropanol;
- unidentified nasal sprays;
- Fenbid tablets – an antiflammatory drug;
- a large vial of Erythromycin powder for injection;
- Prednisolone for injection.

At 20:00 hours, the Dorset Health Protection Unit briefed the Head of the Anthrax Division of CAMR, the RHEPA and the Communication Leads for Regional Health Emergency Planning and the Dorset and Somerset Strategic Health Authority on the findings on the beach.

Day 2

On 21 January 2003 the Health Protection Unit spent several hours identifying a lead Naval contact to attend the Silver Command meeting to be held on 22 January 2003. Once identified the naval lead was extremely helpful.

During the 21 January 2003, there were continued reports of materials being washed up along the south coast although it was unclear whether material washed up in the vicinity of Hayling Island near Portsmouth was linked to the incident at Dorset.

Day 3

At the Silver Command meeting on 22 January 2003 it was reported that Coastguards had now searched the coast along a 30-mile stretch extending from Beer in Devon to Bowleaze near Weymouth. While there had been occasional finds along the coast, the bulk of the material had landed on the beaches of West Bay and Freshwater near Bridport. A number of needles and syringes had been found but these had all been used and were not in their original packaging. They were not, therefore, believed to be linked to this incident. The Coastguard Agency reported that used needles and syringes are not an unusual find on Dorset beaches. There was a disturbing report that diazepam, a material called High Bombazine and diamorphine had been found at Seaton and Chesil Beach. It was agreed at the Silver Command meeting that a member of the Dorset Health Protection Unit staff would view this material to confirm its identity. It was also confirmed during the Silver Command meeting that a scientific officer from CAMR had visited the West Bay Depot on the evening of Monday, 20 January 2003 and confirmed that the materials retrieved from the beaches were as labelled on the containers.

At 13:10 hours on 22 January 2003, the Dorset Health Protection Unit received a telephone call from a senior Naval officer to confirm that this matter had been passed over for investigation to the Naval Police. The officer requested that a typed list of agents found on the beaches should be made available to the Navy and that this would be forwarded to the Medical Supplies Agency to be checked against stocks of materials issued to naval vessels in recent years.

Day 4

On 23 January 2003, a member of the Dorset Health Protection Unit viewed the materials washed up at Seaton and Chesil Beach and which were being held by the Coastguard Agency (photographs 1 and 2). No diazepam or diamorphine was present but temazepam capsules had been found and the packaging contained a considerable level of detail about their manufacturer.

By 15:00 hours on 23 January 2003, it was apparent to all agencies that less material was now washing up on beaches, possibly due to the direction of tide and the wind. A Press Release was sent out on that day from West Dorset District Council and containing pictures of the material washed up on the beaches. This Press Release contained information provided by the Dorset Health Protection Unit, after discussion with CIRS and included advice to the general public not to touch suspicious materials on the beaches and particularly to keep children and dogs well away from the packages. The Fenbid tablets could have been seriously toxic to small dogs in particular.

By mid March 2003, the West Dorset District Council finally received a licence allowing them to transport the material from the beaches to Porton Down, using SITA. The responsibility for funding the clean up operation will lie with the polluter.

Lessons learned

- any single agency can call a major incident and it was invaluable to have an early Silver Command meeting in order to:
  - share information on the events at the scene;
  - plan urgent actions;
  - agree a Press Release to keep the public informed;
- given the large number of agencies involved in this incident, it was helpful to have pre-existing good working relationships forged through the local interagency Emergency Planning Committees;
- there was initial difficulty in identifying a clear Naval lead
- there is a high level of background contamination with needles and syringes on the local beaches;
- it was valuable to have eye witness descriptions of the materials washed up by Dorset Health Protection Unit staff who were able to interpret the labelling on the packaging and the vials;
- photographs taken with a digital camera were useful in briefing CIRS, the RHEPA and informing the general public through Press Statements;
- during the course of the incident, a number of materials were washed up along the south coast and it was unclear as to the significance of some of them. There are no suitable testing laboratories in Dorset and some of the material washed up in both Dorset and Hampshire remains unidentified. National clarification on the source of funding to undertake analysis of materials washed up in this type of incident, would be helpful;
- the early advice from CIRS on the irritant effects of dimercaptopropanol were extremely helpful in protecting the first responders and the information about the impact on animal health should be considered when areas are contaminated which are regularly used by dog walkers;
- the information held by the Dorset Health Protection Unit has been made available to the Military Police to assist them with their investigation and this highlights the importance of keeping an accurate incident log and again highlights the usefulness of photographs.

Review of two recent shoreline incidents reported to the Chemical Hazards and Poisons Division (London)

Robie Kamanyire, Senior Toxicology Information Scientist, Chemical Hazards and Poisons Division (London)

Contamination of the UK shoreline is not uncommon, the incident along the Dorset coastline (pages 11-13) was not a singular event, and several 'incidents' were reported at the start of 2003. The range of contaminants found along the UK shoreline is unpredictable and may present a challenge when carrying out an initial risk assessment.

Incident 1

In late February 2003, a Harbour Master on the South Coast informed the National Focus at 10:30 a.m. about a potential incident within his harbour. A single plastic vial (approximately six inches in length) containing an orange fluid had been discovered in the harbour. The beach was initially cordoned off and the emergency services (fire, police and ambulance) attended the scene along with a representative from the local borough council.

The police performed a risk assessment and determined that there was no major risk or threat. Digital photographs were taken to assist in the identification of the vial (photograph 1). The vial was then removed by a contract cleaning company and the beach reopened at 14:30.

The 'vial' turned out to be a discarded 'lightstick', generally used by fishermen, but in view of the heightened awareness along the south coast following the incidents in Dorset, the initial response, including that of the emergency services was to proceed with caution until an appropriate risk assessment had been undertaken.

Photograph 1: 'lightstick' © Sovereign Harbour Marina Limited

Photograph 2: Aluminium flask on gravel © Isle of Wight Council Beach Inspection Unit

Incident 2

A similar incident occurred a few weeks later, with the discovery of aluminium canisters along beaches again on the South Coast (photograph 2). Over 50 canisters were discovered by both the Maritime and Coastguard Agency (MCA) and Naval staff, along a large stretch of coastline. The canisters, resembling water bottles or thermos flasks, were unmarked apart from an unusual numbering system, indicating that they were designed for the carriage of hazardous waste. Some appeared to be up to 30 years old. The majority of theses canisters appeared to empty.

The flasks were collected by the police, MCA and Navy and stored in a secure area prior to some being sent for analysis. Members of the public were advised, via local radio and other media, not to touch the containers but to report their location to the police. The canisters were eventually analysed and found not to contain any hazardous substances.

Lessons learned

These two incidents and the 'anthrax' incident provided some excellent lessons, namely

- Facilities for identification, environmental sampling, should be available
- Facilities for safely decontaminating or handling contamination and in some cases providing secure storage should be available
- Health Protection Units (HPU) should maintain close links with their neighbouring HPU's as chemical incidents involving shorelines are often not restricted to a single location
- Digital cameras can be invaluable in assisting in the rapid dissemination of information which may help the identification and risk assessment process

Procedure for dealing with potentially hazardous containers found on the Sussex coastline

Procedure for dealing with potentially hazardous containers found on the Sussex coastline 11th. draft (Approved by Emergency Services Major Incident Working Group on 17th April 2000)

This Sussex checklist/procedure describes the roles and responsibilities of the various agencies involved and their process for response.

The following organisations are likely to become involved in responding to (potentially) hazardous containers on the shoreline, and have responsibilities as listed:

District and Borough Councils / Brighton & Hove Council (hereafter referred to as 'Councils')

- inspect and, if possible, identify contents without risk to human health
- removal of containers
- close off beaches if necessary
- inform MCA Counter Pollution Branch

East / West Sussex Fire Brigade

- inspect, contain and make safe suspect containers
- provide Hazchem data to responders as appropri-ate
- notify the Environment Agency and / or Health Authority if considered a danger to health or the environment

Maritime & Coastguard Agency (M.C.A.)

a. H.M. Coastguard
   - assist in public safety

b. Counter Pollution Branch
   - receive information on confirmed hazardous containers
   - where it is believed that hazardous containers are part of a more widespread incident, co-ordinate the dissemination of information received to Councils and emergency services which the MCA consider to be under threat, through established 24 hour contact procedures

Sussex Police

- assisting Councils with closure of beaches / crowd control etc.
- effecting evacuation if necessary

Environment Agency

- provide advice on environmental issues associated with hazardous substances
- provide advice on storage and disposal of hazardous substances

East Sussex Brighton & Hove / West Sussex Health Authority (now Health Protection Unit)

- provide advice on public health issues, if necessary seeking advice from the of Chemical Hazards and Poisons Division.

Procedure for dealing with an incident

The emphasis must be upon safety first. Inter-agency cooperation and flexibility of approach should enable incidents to be dealt with in accordance with responsibilities, skills and appropriate equipment. The initial report might come from a number of sources, or be reported to any of several different agencies. The necessary action will depend upon which of the following categories the incident appears to fall into:-

A. APPARENTLY NON-HAZARDOUS i.e. nothing in the initial report suggests any leakage.

Action:

1 inform Council in which located – to inspect, remove and dispose
2 If upon examination they suspect the contents to be 'potentially hazardous', and the container is leaking or unstable, they should immediately upgrade the response.

B. POTENTIALLY HAZARDOUS i.e. there is an indication that the container may be leaking a dangerous or unknown substance.

Action:

1 inform Fire Brigade - to inspect and attempt to identify the content
2 inform H.M. Coastguard - to assist in public safety
3 inform Council – to isolate beach

N.B. Those attending should approach from upwind, and if without appropriate personal protective equipment should remain at a safe distance at all times.

If the Brigade establish that the container is non-hazardous, action reverts to A. above. If the container appears upon inspection to be hazardous, further action should be:-

- Fire Brigade cordon off hazardous area
- Fire Brigade inform Environment Agency to provide advice
- Fire Brigade inform Health Authority via Sussex Ambulance Service - to provide public health advice
- Council inform Police - to assist with beach closure and additional security if required
- Council inform M.C.A. Counter Pollution Branch via HM Coastguard

REMOVAL is the responsibility of the Council in whose area the container is found, wherever possible before the next high tide so as to avoid it beaching elsewhere. Examined containers must not be left unattended as someone could interfere with them, and should only be removed in accordance with scientific advice.

Advisory Committee on Protection of the Sea (ACOPS)

Dr Trevor Dixon, Scientific Officer, ACOPS, 11, Dartmouth Street, London SW1H 9BN Tel (020 7799 3033) Email: tdixon01@bcuc.ac.uk

Introduction

The primary aim of the Advisory Committee on Protection of the Sea (ACOPS) is to promote and implement strategies for the sustainable development of the coastal and marine environment, through scientific, legal and policy research, advisory and public awareness activities, and development of project proposals for Partnership Conferences of all stakeholders. Studying our seas and oceans both as indicators of pollution and as a threatened resource in their own right, ACOPS strives to identify cost-effective, long term environmental solutions that can be effectively implemented across the world, and to present these solutions to stakeholders in order to solicit commitments for concrete actions.
Further information can be found at
http://www. acops.org/What_is_Acops.htm

Recovery of potentially hazardous materials in coastal waters and on beaches has been a recurring problem for public and private organisations for many years. These materials may directly harm the marine environment and pose a potential hazard to health and public safety on beaches and in coastal wa-ters.

The types of materials include packaged dangerous goods lost from ships' cargoes (including chemicals); certain types of ships' garbage (including clinical wastes and pharmaceutical products) and munitions

Table 1 : Summary of major incidents involving packaged dangerous/harmful goods lost from vessels operating in the waters around the British Isles

Name of vessel	Date	Type of incident	Nature of incident	Area affected
Germania	January 1972	Coaster caught fire and sank.	Drums of dangerous chemicals drifted 160 km ashore.	Cornwall
Aeolian Sky	November 1979	General cargo vessel sank following collision.	Many unmarked packages washed ashore.	Southern England
Craigantlet	February 1982	Container vessel ran aground.	Inaccurate identification of the contents of pressure vessel tanks.	Portamaggie Bay, Scotland
European Gateway	December 1982	Ro-ro ferry capsized following collision.	Dangerous goods cargo recovered over a large area.	Kent coast and German Bight
Dana Optima	January 1984	Ro-ro ferry lost deck cargo in heavy weather.	Loss of 80 drums (16 tonnes) of concentrated herbicide dinoseb.	Area to the north of Dogger Bank
Mont Louis	August 1984	Ro-ro vessel capsized following collision.	30 containers of uranium hexaflouride recovered.	Norfolk
Forum Hope	October 1984	General cargo vessel lost deck cargo in heavy weather.	Unmarked and leaking packages washed ashore without warning.	Dorset coastline
Filia Sea	March 1987	General cargo vessel lost deck cargo.	Packages stranded on beaches without warning.	East Anglia
Ardlough	September 1988	General cargo vessel sank after striking quay.	Leaking tank containers washed ashore.	Cumbria and Lancashire
Wessertal	October 1988	Ro-ro ferry lost deck cargo.	Leaking 24,000 l tank container adrift for 4 weeks.	Southern North Sea
Perintis	March 1989	General cargo vessel capsized and sank.	Recovery operation failed to locate some of the pesticide cargo.	English Channel
Muree	October 1989	General cargo vessel sank over many weeks.	Unmarked packages washed ashore	South Wales to Norfolk
Fathulkhair	February 1990	Freighter lost deck cargo.	6 canisters of potassium cyanide washed ashore without warning.	Kent and Sussex
Nordic Pride	May 1991	Ro-ro ferry lost deck cargo.	2 'huktra tricks' washed ashore in a leaking condition causing an evacuation of the local population.	Norfolk coastline
Sherbro	December 1993	Containership lost 88 box containers over-board.	Search and recovery operation mounted for 62 t of dangerous cargo including nitrocellulose, flammable liquids and seed treatment Apron plus, over a 3 month interval	Seine Bay to Germany
Tokio Express	February 1997	Containership lost 62 box containers over-board.	800 glass phials of methyl methacrylate monomer inhibited missing, some recovered ashore.	Cornwall
Norse Mersey	April 2000	Vessel lost overboard 4 packages including 2 iso-tanks.	1 package containing residues of epichloro-hydrin (UN 2023) and another 40 tonnes of the marine pollutant paracresol (UN 2076)	North Sea

Photograph 1: Examples of dangerous goods, ships garbage and munitions found on UK beaches © Trevor Dixon

and pyrotechnics attributed to former inshore dumping grounds. Examples of materials found are shown (photograph 1). Table 1 summarises the major incidents involving packaged dangerous/harmful goods lost from vessels operating in the waters around the British Isles.

Adverse health effects have been associated with exposure to harmful materials lost found on the shoreline. An example is given below.

Incident Report

Thanet District Council reported that on 30 August 1992 a 17 year old girl suffered burns. Witnesses reported that she had inadvertently picked up a piece of white phosphorus from the beach which later ignited in her pocket when it dried out. Her mother and sister also sustained minor burns as they attempted to deal with the emergency. Although not known it is thought that the phosphorus came from commercial not military sources.[1]

ACOPS Surveys

Previous surveys undertaken by ACOPS and the Keep Britain Tidy Group in 1982/83[2] and 1991/92[3] identified a number of problems experienced by the competent authorities in responding to incidents involving these materials. These problems included:

- recovery of costs incurred in clearance and disposal operations;
- identifying sources of materials;
- inadequate markings and labels to identify the nature of hazards posed by particular items or packages;
- compensation and liability arrangements following incidents; and
- assessing the extent of risk posed by such material to bathers and other beach users.

A third national survey has been commissioned by the Maritime and Coastguard Agency running from 1 March 2002 to 28 February 2003. The primary aims are to monitor progress against tighter international controls introduced in recent years and highlight trends in the nature and scope of the problem affecting the UK coastline. The report will be published later this year.

References

1 Dixon TR. Coastal Survey of packaged chemicals and other hazardous items. Advisory Committee on Protection of the Sea. Submitted to CUE Marine Division , Depart-ment of the Environment, 31 December 1992. Page 97

2 Dixon Trevor R, Dixon Tim J. Marine Litter Research programme Stage 6. Keep Britain Tidy Group. September 1995

3 Dixon TR. Coastal Survey of packaged chemicals and other hazardous items. Advisory Committee on Protection of the Sea. Submitted to CUE Marine Division , Depart-ment of the Environment, 31 December 1992. Page 97

Thunderstorm asthma and The Met Office Health Forecast Unit

Noel Nelson, Senior Environmental Consultant, Mark Gibbs, Health Forecasting Business Manager, Met Office, health@metoffice.com, other informat ion can be found at www.metoffice.com/health

Introduction

Whilst there is a large focus on the health impacts of accidental or deliberate release of chemicals / toxins it is important not to forget naturally occurring events.

In recent years much work has been undertaken to investigate possible links between pollution and health. Because of its complexity, the weather has often been treated as a confounding factor in the search for true relationships. Respiratory problems and asthma in particular have often been the subject of many of these studies, and with good reason. Asthma has become a growing problem in many parts of the world, affecting both adults and children. In the UK as many as 2,000 people die from asthma each year. It is thought that 10 – 15% of people suffer with the condition and prevalence appears to be increasing. Symptoms normally associated with this disease can be triggered or exacerbated by a number of stimuli (environmental, life style etc) and it would appear that weather is definitely a factor. Asthma attacks are seasonal, and it is now widely recognised that certain thunderstorms can be associated with asthma hospital admissions.

The Met Office Health Forecast Unit (HFU) working with the medical consultant Dr William Bird runs a program of activities designed to provide forecasts of potential increases in medical workload due to weather related triggers. This work has been enhanced by collaboration between the HFU and Dr Shuaib Nasser, Chest Consultant from the Dept. of Allergy & Respiratory Medicine at the Addenbrooke's Hospital in Cambridge. Together they hope to be able to explain and accurately predict 'asthma storms'.

Incident summary

A good example of how environmental conditions could conspire in such a way as to trigger asthma attacks was provided in the summer of 2002. That summer was quite wet with 'thundery' activity resulting in localised flooding. It is believed that one such thunder storm event led to an outbreak of asthma in eastern England on the 30th July night. The main factors that contributed to the outbreak were as follows;

- the days leading up to and including the event were very warm and dry
- grass pollen levels were unusually high
- ozone concentrations throughout many locations were increasing
- a series of mesoscale thunderstorm cells had been making their way northwards from London and Essex

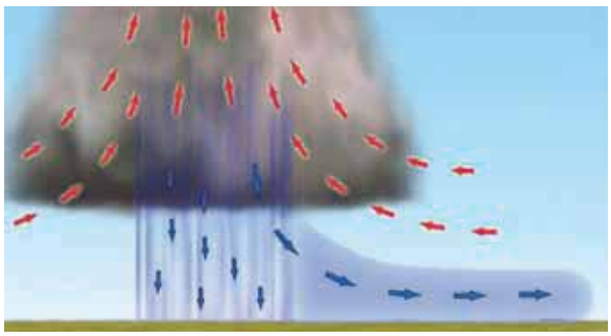


Figure 1: Schematic profile of airflow in a thunderstorm © Met Office

It is believed that as the storm cells moved north. large quantities of pollen from a wide area were sucked up within its 'updraught' mechanism (see fig-ure 1 'red arrows'). The combination of this and the electrical activity resulted in the splintering of the pollen case to produce much smaller grains and so making them more allergenic. As these grains were released through the 'downdraught' process of the cell (see figure 1 'blue arrows') in a more concentrated area, many people inhaled them and soon experienced chest tightness.

Within 36 hours of the thunderstorm some 57 patients attended Dr Nasser's hospital in Cambridge. 27 patients presented at the Accident

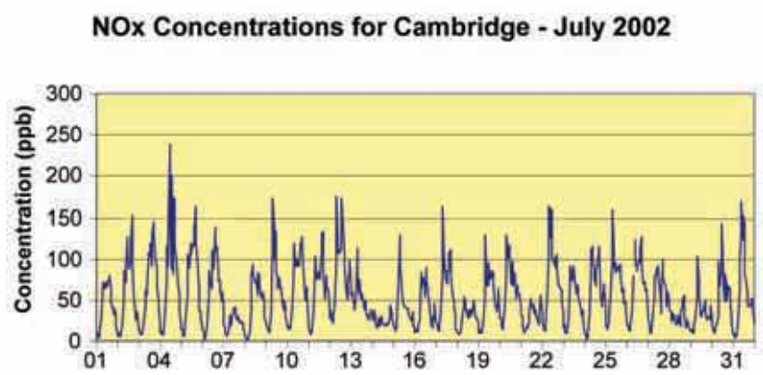


Figure 2

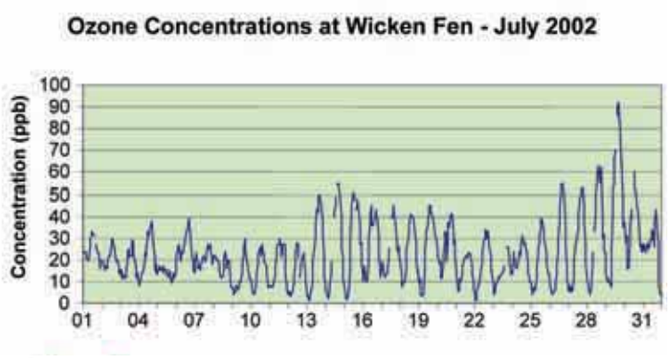


Figure 3

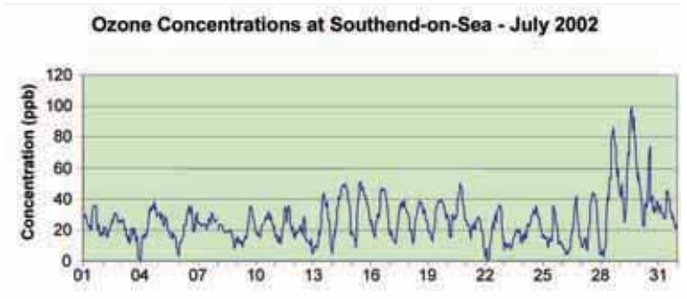


Figure 4

and Emergency, 14 at the In-Patients Department, 3 needed to be treated in Intensive Care and 1 patient died. Sudden increases in asthma cases like these were observed at many hospitals that lay near the track taken by the storm cell.

Possible meteorological and pollution associations

It is very likely that heightened pollution levels before and at the time of the event also played an important role in the events of the 29th and 30th of July. The national network of automatic pollution monitors recorded high concentrations of oxides of nitrogen in Cambridge throughout July (figure 2).

In addition, concentrations of ozone rose rapidly on the 28th and 29th of July in locations on the outskirts of Cambridge. Ozone concentrations are limited by the presence of nitrogen dioxide – typically found in exhibited the combination of thunderstorm and high pollen and pollution levels. Figure 4 shows ozone concentrations in Southend-on-Sea for July 2002. Note elevated levels again around the end of the month.

The Met Office Health Forecast Unit

Being able to forecast increases in asthma cases that may result in hospital admissions is part of the Met Office project to forecast workload on the health sector. The Met Office, working with many partners including the Department of Health, NHS trusts, GP co-ops, ambulance services and academics has completed a 2 year pilot project funded city centres as a result of car fumes. Consequently, ozone tends to form at city outskirts where traffic pollutants have been diluted. Figure 3 shows ozone con-centrations recorded at Wicken Fen just to the north east of Cambridge. Ozone is a pollutant known to cause respiratory problems at concentrations approaching 100ppb.
It is interesting to note that during the month of July many locations experienced elevated ozone levels. As the thunderstorms moved northwards through London and Essex and onto other eastern locations, the clusters of asthma cases presented themselves in areas which by the Treasury's Invest to Save Budget.

On a daily basis the Met Office collates various types of information:

- Current levels of infectious disease
- Current workload, both hospital admissions and GP out-of hours consultations
- Environmental, weather, pollution, pollen etc

This data is fed into a computer model that calculates admissions for each postcode sector, that can then be aggregated up to match hospital, or ambulance service 'catchment' areas. This information is then delivered by a secure website to the participating users. Last winter saw 30 hospital acute trusts, Strategic Health Authorities and 45 GP out of hours providers involved in the project.
A number of evaluation reports are being compiled on the project before the next steps are decided.

Sources of Information

- The Met Office Link magazine - Issue 2, October 2002
- Presentation by Dr Shuaib Nasser at the Health Forecast Conference 15th July 2003 - Stratford-Upon-Avon
- Pollution data from the UK National Air Quality Information Archive at ht tp://www.aeat.com/netcen/airqual/

The authors gratefully acknowledge the information provided by Dr William Bird, Met Office and Dr Shuaib Nasser, Chest Consultant from the Dept. of Allergy & Respiratory Medicine at the Adden-brooke's Hospital in Cambridge

Emergency Preparedness

Introduction

Dr Virginia Murray Consultant Medical Toxicologist Chemical Hazards and Poisons Division (London)

Following the interest generated by the emergency preparedness section in the April 2003 Chemical Incident Report, a further short update on developments has been included:

- East Anglia Ambulance developing easier handling of equipment
- the New Dimension Mass Decontamination equipment now being used by the Fire Brigades
- A draft of a process for implementing emergency securing procedures for Accident and Emergency Departments (A&E)
- A&E deployment of PPE with a draft action card
- Draft Advice to the public on decontamination following a chemical, biological or radiological incident

Developing easier handling of decontamination equipment for an Ambulance Trust

Gren Morgan, Emergency Planning Officer, East Anglia Ambulance Trust

In order to facilitate the rapid deployment and ease of handling decontamination equipment for decontamination teams within the East Anglia Ambulance Trust new vehicles have been purchased and tail lifts have been fitted (photograph 1). The vehicles have been designed to hold a complete issue of pre hospital decontamination equipment, nerve agent pod, modesty pod, 30 complete sets of CPPE and all other ancillary equipment required to perform decontamination All the equipment in the vehicle has been mounted on wheels or placed in mobile cages allowing for easy mobility and manual handling. (Modesty pods now placed in cages for easy recognition of equipment and mobility (photographs 2 and 3). There are two incident vehicles in Norfolk, Suffolk and Cambridgeshire, one being the decontamination vehicle and one carrying all the major incident equipment. All the equipment interlinks and for call out purposes, both vehicles respond together.

Photograph 1: Major Incident Support vehicle @ East Anglia Ambulance Trust

Photographs 2 and 3 : Wheels on everything © East Anglia Ambulance Trust

Fire Brigade decontamination of the public

Dr Virginia Murray Consultant Medical Toxicologist Chemical Hazards and Poisons Division (London)

The Office of the Deputy Prime Minister has announced on its web site http://www.odpm.gov.uk/stellent/groups/odpm_fire/documents/page/odpm_fire_022648.hcsp that “protection of the public in England and Wales was further enhanced as the first of the Government's ultramodern New Dimension equipment for the fire and rescue service went into operation.” Information given below has been summarised from this web site.

Local Government Minister Nick Raynsford, also responsible for the fire and rescue service, stressed that there is no imminent specific threat: "The provision of this equipment is purely precautionary - it is to improve the capability of the fire and rescue service including responses to nonterrorist incidents such as an accidental chemical spill in a factory."

What is New Dimension?

'New Dimension' was launched post 9/11 to review fire and rescue service preparedness against a potential terrorist threat. The ODPM-led programme will ensure that the fire and rescue service is sufficiently trained and equipped to deal safely and effectively with major chemical, nuclear, biological and conventional terrorist incidents on a national scale. This activity is in partnership with the Department of Health.

The new system, built to exacting fire and rescue service specifications and funded from the £56m set aside by central government for mass decontamination, includes purpose-built response vehicles, portable shower units and specialist protective clothing making our fire fighters some of the best equipped in the world to deal with mass decontamination incidents.

About the new equipment

The programme has completed extensive specification and testing and brings, for England & Wales, 160 purpose built decontamination units each capable of handling some 200 people an hour per unit.

The equipment also consists of 80 new response vehicles designed to transport the decontamination unit with a fork lift truck to assist with deployment at the site of the incident. These vehicles begin to enter service during the Autumn. In the interim temporary vehicles have been hired. The structure (photograph 1) is supported by a patented articulating frame technology, requiring no maintenance once erected.

The 160 decontamination units consist of three cubicles for disrobing, showering and re-robing. Features include:

- Heating
- Warm water supply (35° C), working on an automatically controlled, three minute cycle for more effective decontamination
- Facilities to accommodate different cultures, disabled persons and casualties on stretchers.
- Disrobing and re-robing packs to cater for immediate needs
- Integral waste water containment and disposal facility
- Dimensions erected : 14m long x 3.75m wide x 3 m high
- Dimensions packed : 2.7 m long x 1.5 m wide x 1 m high
- 4 overhead hand sprayers
- Purpose designed, waterproof lighting

Photograph 1: Mass decontamination structure @ New Dimensions, East Region Team

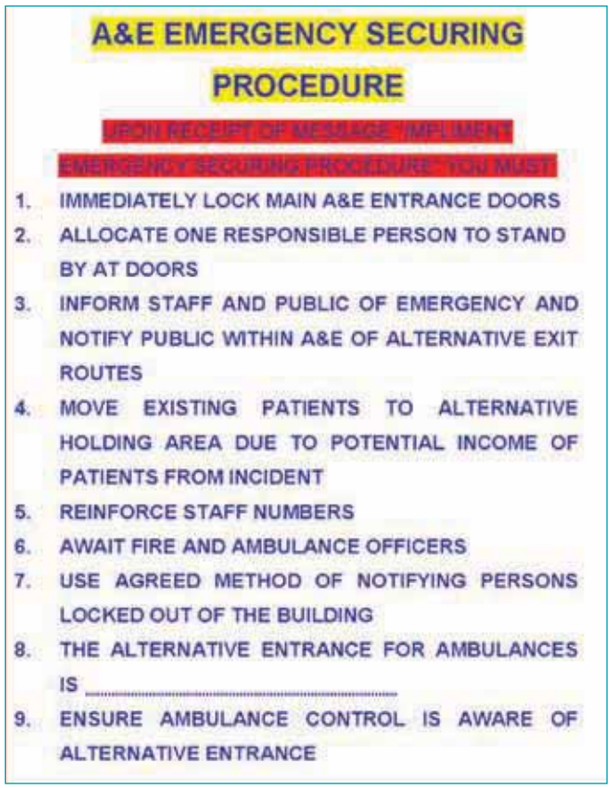
Draft: implementing emergency secur-ing proce-dures for Accident and Emergency Departments

Nigel Robinson, Regional Planner & Coordinator, South East Region, New Dimension Team, Fire Service Project South East Region

A system for securing Accident and Emergency Departments (A&E) to try and prevent contamination from unexpected contaminated casualties entering departments in the event of a deliberate or accidental release of chemical, biological, radiological or nuclear (CBRN) substance has been developed. The aim is to allow an A&E enough time to set up clean and dirty zones using personal protective and decontamination equipment to manage casualties in an appropriate manner.

Draft action sheets (three are illustrated) and protocols have been developed between the New Dimension Fire Service Project South East Region UK in conjunction with local hospitals. These action cards and protocols have the support of the local Health Emergency Planning Advisers concerned. These drafts may be useful in developing local plans on securing hospitals during such an incident.

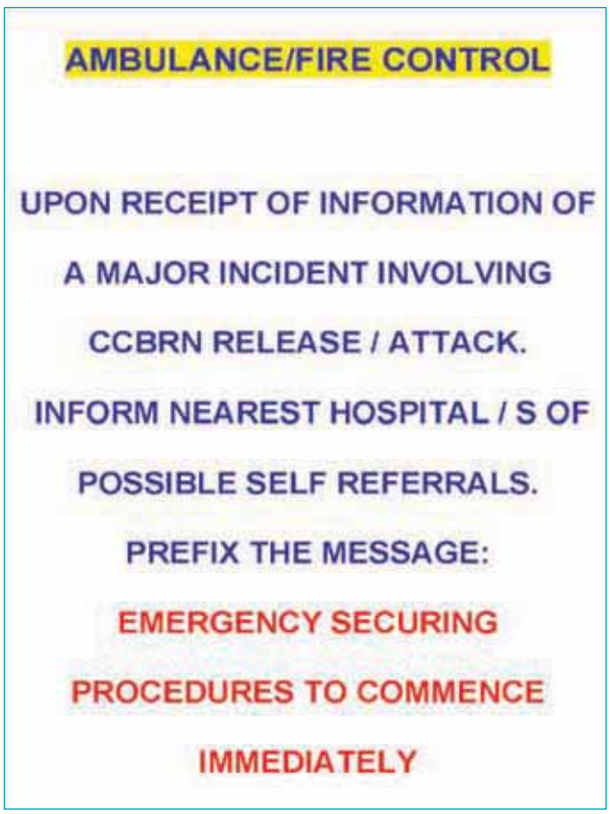
Please contact Nrobinson@buckinghamshire.fire-uk.org for further information



A&E EMERGENCY SECURING PROCEDURE

UPON RECEIPT OF MESSAGE "IMPLIMENT EMERGENCY SECURING PROCEDURE" YOU MUST

1. IMMEDIATELY LOCK MAIN A&E ENTRANCE DOORS
2. ALLOCATE ONE RESPONSIBLE PERSON TO STAND BY AT DOORS
3. INFORM STAFF AND PUBLIC OF EMERGENCY AND NOTIFY PUBLIC WITHIN A&E OF ALTERNATIVE EXIT ROUTES
4. MOVE EXISTING PATIENTS TO ALTERNATIVE HOLDING AREA DUE TO POTENTIAL INCOME OF PATIENTS FROM INCIDENT
5. REINFORCE STAFF NUMBERS
6. AWAIT FIRE AND AMBULANCE OFFICERS
7. USE AGREED METHOD OF NOTIFYING PERSONS LOCKED OUT OF THE BUILDING
8. THE ALTERNATIVE ENTRANCE FOR AMBULANCES IS .....
9. ENSURE AMBULANCE CONTROL IS AWARE OF ALTERNATIVE ENTRANCE



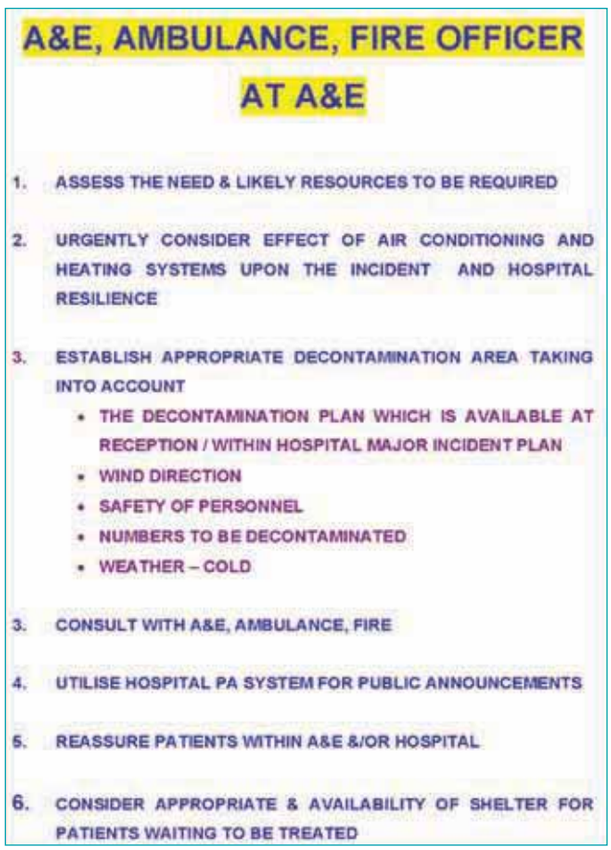
AMBULANCE/FIRE CONTROL

UPON RECEIPT OF INFORMATION OF A MAJOR INCIDENT INVOLVING CCBRN RELEASE / ATTACK.

INFORM NEAREST HOSPITAL / S OF POSSIBLE SELF REFERRALS.

PREFIX THE MESSAGE:

EMERGENCY SECURING PROCEDURES TO COMMENCE IMMEDIATELY



A&E, AMBULANCE, FIRE OFFICER AT A&E

1. ASSESS THE NEED & LIKELY RESOURCES TO BE REQUIRED
2. URGENTLY CONSIDER EFFECT OF AIR CONDITIONING AND HEATING SYSTEMS UPON THE INCIDENT AND HOSPITAL RESILIENCE
3. ESTABLISH APPROPRIATE DECONTAMINATION AREA TAKING INTO ACCOUNT
   - THE DECONTAMINATION PLAN WHICH IS AVAILABLE AT RECEPTION / WITHIN HOSPITAL MAJOR INCIDENT PLAN
   - WIND DIRECTION
   - SAFETY OF PERSONNEL
   - NUMBERS TO BE DECONTAMINATED
   - WEATHER – COLD
3. CONSULT WITH A&E, AMBULANCE, FIRE
4. UTILISE HOSPITAL PA SYSTEM FOR PUBLIC ANNOUNCEMENTS
5. REASSURE PATIENTS WITHIN A&E &/OR HOSPITAL
6. CONSIDER APPROPRIATE & AVAILABILITY OF SHELTER FOR PATIENTS WAITING TO BE TREATED

Deployment of PPE in the event of a chemical incident. The importance of pre-planning and estimating capacity

Dr Tanya Malpass, Consultant in Emergency Medicine, Buckinghamshire Hospitals NHS Trust. Martin Blunden CBRN lead Buckinghamshire Fire and Rescue.

Background

NHS hospitals have been updating their plans relating to the management of contaminated casualties and have been allocated funding to purchase carefully specified decontamination and Personal Protective equipment (PPE). Most, though not all, trusts have now taken delivery of kit. A standard issue consists of: one mobile decontamination unit; 16 sets of PPE; 9 filtration units each requiring a pair of filters of which 16 pairs are provided. (Central funding has recently been extended to another 8 complete suits though this is primarily intended to allow for contingency and replacement.)

Because of the difficulties in training and updating staff the actual availability of staff able, willing and qualified to participate may also limit PPE and decon-tamination capacity.

Failure to appreciate the difficulties and limitations in achieving adequate control and containment can put the facility, staff and patients at risk. For this reason we have set out below a number of aids which we have found useful in the planning of a controlled response.

- Calculations of capability based on local resources
- A chart to illustrate maximal deployment of PPE and role allocation
- A generic action card for control of PPE, including list of decision criteria (page 29)

Baseline Calculations

A simple calculation of number of PPE suits deployed multiplied by the number of 30 minute filter pairs used per hour (up to maximum of 16) permits calculation of duration of PPE cover. This gives decontamination time available and so permits calculation of number of patients it is possible to decontaminate. Such over simplification, however, does not take into account the logistics of managing the filter changes and exit procedures of staff in PPE.

Points to consider in calculating capability:

- Number of persons in PPE is limited by number of filtration units deployable
- Staff, work in “buddy” pairs for safety.
- Staff must exit to change filter every 30 mins. This takes up 10 mins of decontamination unit time per pair, thus deployment of 8 suits uses 70 mins of decontamination unit time excluding the exit of the final pair.
- Staff should therefore enter PPE at a maximum rate of 2 per 10 mins
- The first 10 mins at least is likely to be given over to triage and containment no matter how many staff are finally deployed and not to active decontamination.
- A decontamination rate of 2 persons per 10 minutes in the mobile unit is based upon ambulant, cooperative patients. For more severe, non-ambulant or uncooperative cases decontamination rate is probably only 1 per 10 mins.
- Calculations include no contingency for need for early exit of staff due to problems.

KEY: cf = change filter
CTO & N1 = Chemical triage officer and assistant: duties defined by action card (locally specific)
D1&2 = decontamination team: duties as defined by action cards (locally specific)
N1,2,3 = Control and containment team: duties in holding zones defined by action cards (locally specific) early exit of staff due to problems.

Chart 1: to demonstrate maximum possible PPE deployment with standard NHS supply of 16 filter pairs.

time (mins)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
SUIT No 1	CTO	CTO	CTO	cf	D1	D1	D1	exit		
2	N1	N1	N1	cf	D2	D2	D2	exit		
3		D1	D1	D1	cf	N2	N2	N2	exit	
4		D2	D2	D2	cf	N3	N3	N3	exit	
5			N2	N2	N2	cf	N1	N1	N1	exit
6			N3	N3	N3	cf	CTO	CTO	CTO	exit
7				CTO	CTO	CTO	cf	oversee	oversee	oversee
8				N1	N1	N1	cf	D/N	D/N	D/N

Maximal deployment is a six-man team (8 suits deployed) (illustrated on chart 1)

- 3 pairs enter over first 30 mins but as the fourth pair enters PPE the first pair is exiting thus maximum PPE deployment at any one time is six not eight.
- Peak PPE cover comprises 6 persons for duration of 1 hour.
- Total PPE cover spans a period of 100 mins.
- Patient Decontamination capacity = 100 mins − 80 mins (set up and staff decon time) = 20 mins = 4 ambulant patients or 2 stretcher cases.

Minimal deployment is a 2-man team (4 suits deployed)

- Two persons in PPE would need to exit and change filter after 30 mins. In order to maintain a constant 2 man PPE presence another pair would have to be deployed prior to this i.e. 4 persons in all (30 mins on duty, 10 mins filter change and 20 mins rest)
- A two-man team can either triage and decontaminate or perform control and containment.
- 4 persons could maintain a two man presence for a duration of up to 4 hours,
- Patient decontamination time = 240 − 80 = 160 mins. = 32 patients BUT:
- The numbers 2 people are able to cope with rather than the unit availability will limit patient decontamination capacity. Probably <10 cooperative, ambulant patients)

Intermediate deployment 4 man team (6 suits de-ployed)

- A 4 man PPE team can perform some decontamination as well as triage and containment duties.
- Patient decontamination capacity = 130 − 80 = 50 mins = 10 ambulant or 5 stretcher cases

Conclusions

Whilst this is by no means an infallible formula for calculating capabilities it does illustrate the problems before us. So how should we consider using such capabilities?

Maximal deployment of a 6-man team using 8 filtration units (with each occupant undergoing 1 filter change) is suggested for control of larger incidents or where patients are difficult to manage. Decontamination priority must be given to staff and PPE cover aimed at control and containment. We recommend that patient decontamination in such incidents should be provided by implementation of mass decontamination contingencies within local agreements and backup PPE cover should be identified early to be available within 60-90 mins in order to maintain containment beyond then.

Minimal response of a 2-man decontamination team in full PPE is appropriate only for a well-defined and controlled incident. Although theoretically a total of up to 32 patients could be processed in this way such numbers would certainly require more persons deployed in PPE to help manage containment zones and triage, which would correspondingly reduce decontamination capacity. It seems unlikely that a 2-man team could control more than about 10 co-operative, ambulant patients whilst decontaminating them over the course of an hour or so.

An intermediate level of deployment (4 man team) would be more likely to be deployed in all but the smallest incidents, to maintain control and make possible the decontamination of a small number (4-5) of urgent cases without detriment to staff safety. Any more than 10 ambulant or 5 stretchers would almost certainly require backup PPE to be provided before 2 hrs in order to complete decontamination and/or maintain containment until backup decontamination is organised.

There are of course multiple computations of the solutions suggested but the basic principles hold true and can enable forward planning of resources throughout an incident. It is important that staff are logged in and out and progress is tracked throughout the incident. A PPE control board of some kind is recommended.

We would urge all acute trusts to give careful consideration to the capabilities within their own systems and to work with local partners to agree clear definitions and contingency procedures for escalation when capacity is exceeded, in particular the “New dimensions” links with the fire service, who are developing much improved mass decontamination plans. Whatever local provisions are agreed to offer shelter, containment, first aid and preliminary decontamination for large numbers of contaminated casualties no acute unit should be misled into the belief that centrally provided mobile decontamination facilities are suitable for managing anything other than a small number of casualties from a well defined and controlled incident nor that PPE provision will enable anything more than an initial response to control the site and contain casualties until backup arrives.

If and when hospital staff deploy such resources it should be understood by all users of PPE that control and containment with particular emphasis upon the protection of self, staff, and the facility takes precedence over decontamination of patients.

Draft Personal Protective Equipment (PPE) Controller: ACTION CARD Delegated to: (locally specified post)

Your role is:

- To deploy an appropriate staff response to the arrival of contaminated casualties.
- To coordinate, control and ensure safety of staff in PPE.

Responsibilities

- Ensure that all staff who go into PPE understand routine for changeover, do not spend longer than 30 minutes in the suit without change of filter and undergo correct decontamination/disrobing procedure.
- Agree signal for Distress and Exit procedure
- Communicate with staff undertaking control/containment/decontamination and gather factual information required to make key decisions
- Exchange information relevant to key decisions with the command /control structure and contribute to decision-making process.
- Organise timing and numbers of Staff in PPE and delegate roles as appropriate based upon the above information
- At stand down ensure staff 'Exposure' forms are completed and record all relevant information from log/board and problems encountered

Key decisions

Is this a 'major chemical incident'?

- An incident involving more than the number of cases which can be controlled, contained and de-contaminated by a [2] person PPE team [>4 stretches or >8 ambulant, co-operative cases]

Is there need to call for backup filters/PPE? (assess @ 30 mins)

- Number of persons required in PPE at a time exceeds [4]
- or number of patients still requiring urgent clinical decontamination* exceeds [6]
- or number needing active containment exceeds [20]

Is there need to escalate hospital response (Mass casualty contingencies/declare hospital a site of incident)

- Loss of control or containment at any time
- Or failure to identify appropriate, timely backup PPE/decontamination facility (as defined above) by 60 mins.

Tasks

- Don ID tabard
- Use PPE Log board to record names and roles of staff in PPE, suit number and time of entry and exit.
- Additional locally dictated tasks may be appropriate beyond the above outline. Eg setting up con-trol point and organising change areas etc

(*Clinical Decontamination required = patients who are symptomatic and in need of treatment and therefore need to decant through the mobile decon unit into clean zone ASAP. Patients who are cleaned of gross contaminant, asymptomatic and adequately contained in holding area are not included in this count)

Comment

All items in blue are locally specific.

Items in square brackets are criteria we have used in our trust assuming 8 fully functional PPE sets and locally available resource

Draft advice to the public on decontamination following a chemical, biological or radiological incident

In response to lessons learned from various exercises and subsequent requests from public health staff we have produced the attached draft advice for your comments and suggestions. The purpose is to assist in providing a rapid response to an incident and make sure advice is easily available for potential casualties who may have left the scene without being aware that an incident had occurred. This draft was prepared by the Chemical Hazards and Poisons Divison (London), Health protection Agency (Dr Virginia Murray, Consultant Medical Toxicologist), the National Radiological Protection Board (Dr Jill Meara, Deputy Director, Dr George Etherington, Group Leader, intakes of ra-dionuclides, Mr Neil McColl, Group Leader, Emergency Response) and Communicable Disease Surveillance Centre, Health Protection Agency (Dr Dilys Morgan, Consultant Epidemiologist).

Comments are very welcome, please e-mail
Virginia.Murrray@hpa.org.uk

Draft advice to the public on decontamination following a chemical, biological or radiological incident

Question: I was close to the incident and left the scene of the incident before the emergency services arrived and may be contaminated. What should I do?

Answer: How are you feeling?

If you are feeling ill as a result of the exposure please seek medical advice via NHS Direct (08454647) or, if it is an emergency, call for an ambulance.
If you are feeling well please follow the following advice:

- If you are still close to the incident, or have been asked to shelter, follow the advice provided by the emergency services
- If you have left the scene of the incident and are not in any 'shelter zone' that might have been established but think that dust and debris may have contaminated you then follow the "how to self decontaminate" advice below.

Draft "How to self-decontaminate"

1 Careful removal of clothing and showering or washing is likely to remove most or all of the contamination. You should therefore do the following:

- As soon as possible, go straight to the bath or shower room using the shortest route. Take off all clothes carefully from head to foot to avoid getting dust into eyes, nose or mouth. You could damp them down if they are very dusty.

2 Put clothes in two sealed plastic bags (e.g. bin bags and tape), one inside the other, and label with your name, date and time and where you were exposed to any suspect material. Put the bag in a secure area away from other people and pets, somewhere out of the way (e.g. a room that no-one is using), and away from food and drink, until told what to do with it.

3 Take a shower, bath or change
3.a Take a shower

- wash your hair, direct the water so that it rinses away from eyes, nose and mouth
- avoid swallowing water, or taking it in through the nose
- use a sponge or washcloth, and soap or shower gel. Do not scrub hard or break the skin
- dry yourself normally and dress in clean clothes
- place the towel in two sealed plastic bags, and put it with the bag containing your clothes
- rinse the shower well with clean water

3.b If you do not have a shower, take a bath and wipe all your skin with a washcloth, then discard the water, put the washcloth in two plastic bags and bathe again. Wash your hair being careful not to let water run into your eyes, nose or mouth. Rinse the bath well with clean water.

3.c If you cannot shower/bathe/change clothes do the following: remove clothing except underwear, wash hands, face and, if possible hair, avoiding getting water in your eyes, nose or mouth. If no clean clothes available put clothes back on but avoid putting back on the top layer (e.g., jumper, jacket or coat) which should be placed in sealed plastic bags. You may feel embarrassed to be only partly dressed but it is more important that you remain safe. Put the bag in an unoccupied room away from food and drink (see advice above).

3.d Clean any cuts you may have under clean, running water and cover with a waterproof plaster.

4 Await further information, which will be broadcast on local radio.

If you feel unwell at any time within 48 hours of the incident please call NHS Direct (08454647) for further advice or visit your local GP or Accident and Emergency Department if necessary.

If the incident was presumed to be a biological agent, and you were exposed, you may need some treatment until the results of environmental sampling are available. The local public health professionals should take your details and arrange for this.

If you left the site and want to discuss your need for treatment, discuss with NHS Direct.

Integrated pollution prevention and control

The Basics of Liaising with the Environment Agency (the Agency) with reference to PPC Consultations

Anthony Parsons, Policy Advisor - Human Health, Environment Agency, anthony.parsons@environment-agency.gov.uk.

KEYWORDS

Account Officer Agency Officer responsible for determination of the application, processing and issuing of the permits. He/she may consult with other technical experts within the Agency during the determination process.

Duly Made An application which meets the requirements of the PPC Regulations. The decision as to whether an application is duly made must be made within a very short time which does not allow sufficient time for the Account Officer to study detail of the application.

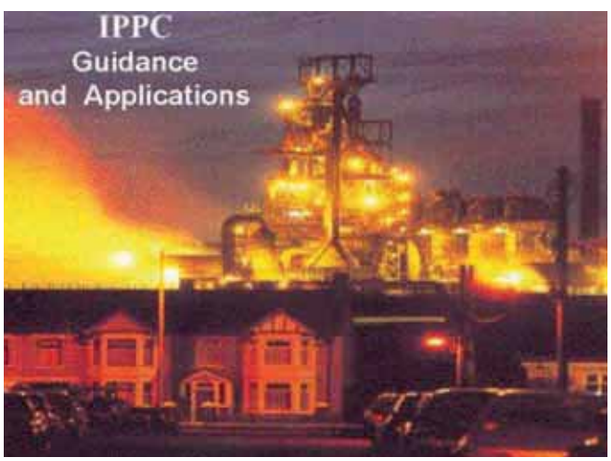
Installation A stationary technical unit where one or more activities listed in Schedule 1 to the PPC Regulations are carried out and other locations on the same site where directly associated activities are carried out which have a technical connection with the activities carried out in the stationary technical unit and which could have an effect on pollution.

Transitional Schedule The programme of dates upon which listed activities come into the PPC regime from January 2001 to March 2007 as set out in Schedule 3 of the PPC Regulations.

Relevant Period The 3 month time window as set out in Schedule 3 of the PPC Regulations within which operators of existing installations must apply for their PPC permit for the activity description to which they belong. For example, certain organic chemicals installations must apply between 1st January and 31st March 2003.

Schedule 4 Notice A notice issued under Schedule 4 of the PPC Regulations requiring the applicant to provide additional information as specified in the notice within a specified period of time.

The Environment Agency will have an 'Account Officer', usually a regulatory officer or team leader, for each IPPC application. The Account Officer is responsible for all contact with the applicant, and will have



experience of regulating that type of industry and may know the site. The Account Officer will generally have had pre-application discussions with the operator with the aim of ensuring that the application contains sufficient information. It is the Account Officer or an officer with equivalent experience who decides whether an application is 'duly made', and they have 14 days from date of receipt to make the decision.

If, during the initial duly made check, the Account Officer considers that information is missing from an application which is likely to be critical to the consultation process then the application should not be considered duly made until it has been provided. However, the duly made process is not detailed and can only realistically ascertain whether the information submitted provides at least a reasonable starting point for consultation and determination.
The operators of activities listed in the PCC Regulations did not need to apply for PPC permits immediately the Regulations came into force (2000). To ensure workloads are manageable different types of activities are required to apply for a Permit according to a transitional schedule, which continues through until 2007. An operator of an existing installation must submit a duly made application within the "relevant period" in the transitional schedule prescribed by the Regulations. If the operator fails to apply within this period, or submits an application which is found to be inadequate (not duly made) he/she will be committing an offence if he/she continues to operate the activity once the application window has closed.

Existing Sites

Applications for permits for existing sites will normally have been submitted within the relevant period for that type of activity. The Environment Agency (having accepted an application as duly made) is then obliged to send out copies of the application to statutory consultees within 14 days.

The process of detailed examination of the application will then begin, and the Account Officer will consult with the relevant experts from within the Agency as necessary. The Agency has a period of 4 months within which to issue the permit, or a longer period as agreed with the applicant. If the Account Officer considers that he/she is not able to adequately determine an aspect of the application with the information supplied then he/she has the option to issue a Schedule 4 notice to formally require the information. The issue of the notice 'stops the clock' on the 4 month determination period. Although it is possible to issue more than one Schedule 4 notice, the aim is to try to minimise the overall determination period so that the activity is brought under regulatory control as soon as possible.

Consultees have 28 days to return their responses to the Agency. Sometimes a short extension can be agreed between parties, but the 4 month clock continues to run. The Environment Agency has a duty to consider any representations made by consultees. It does not have to take the representations into account but will need to provide

sound written justification if it does not. Such a situation may arise where there has been a misunderstanding or the information provided is found to be confusing. Very often it is possible to resolve any differences of opinion by way of discussion between the consultee and the Account Officer.

Where you feel, as a consultee, that the applicant has provided insufficient information for you to be able to take an informed view on the potential risk to public health, you should respond to that effect, specifying the information that you require. It will be very helpful to let the Account Officer know that there is a problem as early in the 28 day consultation period as possible so that the information request to the operator can be made on the same notice as any other request. It may be the case that the information is not available, or can only be made available after monitoring has been carried out, sometimes over a long period. In such cases it is possible to factor such a requirement into the Permit monitoring programme, or the improvement programme. Again, discussions with the Account Officer may be able to identify the most suitable option.

New Site

Where the applicant is applying for a permit for a new installation, the Agency is likely to be under greater pressure to determine the permit within a shorter timescale so that the operator can commence operations or commissioning trials. The application will often be submitted at the same time as the application to the planning authority for planning permission and it will not come under the transitional schedule as described above. Under these circumstances the applicant may not have detailed data on likely emissions and potential impacts from their proposed site. Data may be based upon similar operations, or projected from earlier pilot scale trials.

For new installations where emission and impact data are not available the Agency will consider whether Best Available Techniques (BAT) are to be utilised and refer to the emission benchmarks in the BAT reference notes (BREF)

In order to comply with the statutory 4 month determination period for permit applications the Agency is more likely to issue a permit which requires significant amounts of monitoring in the first few years so as to allow further consideration of impacts. Unlike some other regulatory regimes, the permit can be reviewed at any time if it becomes necessary in order to reflect any further consideration of data. If a substantial change to the permit is required as a result of a review, the Primary Care Trust will be consulted again.

Conclusions

Focus your attention upon the aspects of the application that could have direct implications on the public health of the local population.

Where you have concerns justified by clear toxicological or epidemiological information that releases from the proposed installation may have a possible impact on public health, it would be useful if you could indicate why. The Agency can then work with you to provide the highest level of environmental protection afforded by the legislation.

Where data is not available with which to form a definitive opinion, the permitting process, within reasonable limits (i.e. on a cost/benefits basis), might allow for collection of relevant data with which to move knowledge forwards. PPC is a dynamic process that allows for permits to be reviewed as such data become available and where definitive advice can subsequently be generated.

Tips for Consultees

- Read and understand the PPC Regulations (SI 2000, No 1973), & amendments (a consolidated version of the Regulations is likely to be available soon). The associated guidance issued by Defra is also helpful – "IPPC – A Practical Guide, (version 2 is the latest). (http://www.defra.gov.uk/environment/ppc/ippcguide/pdf/ippcguide_ed2.pdf)
- Be aware of the content of the relevant Agency PPC guidance note for the activity in question. It sets out the level of pollution control that is possible using the best available techniques (BAT). The operator will be required via the permit to work towards the BAT standard, taking into account costs and benefits. These are available via the Agency's web site (www.environment-agency.gov. uk) under the business section and IPPC.
- Realise the limitations of the consultation role. You are being asked to consider the operation of the installation, not whether it should be allowed to operate or not.
- Note that a permit, once issued, can be reviewed or revoked at any time in light of further information.
- The covering letter accompanying the application will give the contact details of the Account Officer handling the particular application. If you have any queries or uncertainties they will be happy to discuss the application with you.
- Seek advice from your contact at the Health Protection Agency. Link to PPC Regulations 2000 SI 1973 http://www.legislation.hmso.gov.uk/si/si2000/20001973.htm

Link to Agency Guidance on PPC Transitional Provisions: http://www.environment-agency.gov.uk/commondata/105385/ippctrans.pdf

Table 1. Number of expected hazardous landfill PPC applications. http://www.environment-agency.gov.uk/business/444217/444663/ landfill/475337/409747/? version=1&lang=_e 3/7/03

Total No	DCHP	Application (London) Anticipated	due date
		No	
Tranche 1	50 sites	16 sites	No later than 9.06.03
Tranche 2	65 sites	26 sites	No later than 9.10.03
Tranche 2B	65 sites	21 sites	No later than 9.12.03
Tranche 3	37 sites	11 sites	No later than 9.05.04
Total	217 sites	74 sites	

Landfill IPPC Permit Applications

Robert Grant, IPPC Support Scientist, Richard Mohan, Engineering Doctorate Student, Matthew Drinkwater, Environmental Scientist, Division of Chemical Hazards and Poisons (London)

The Environment Agency (EA) has recently identified the landfill sites whose operators must apply for a Pollution Prevention and Control (PPC) permit in order to comply with current EU Landfill Directive. Under PPC regulations landfills will be divided into three catagories: Hazardous waste landfills which will only be allowed to take wastes listed on the Hazardous Waste List of the European Waste Catalogue or wastes that have similar characteristics to those listed. These wastes will require treatment unless the treatment does not further the objectives of the Landfill Directive; Non-hazardous waste landfills which may accept municipal waste, other non-hazardous wastes (including inert wastes) which fulfill the relevant waste acceptance criteria and, in certain circumstances, stable, non-reactive hazardous wastes; and Inert waste landfills which will only accept inert wastes that are insoluble, inorganic materials.

The new permits will ensure that sites will be regulated to more rigorous standards designed to enhance the protection of the environment and human health. Sites identified in the first phase of the EA's Conditioning Plan (Tranches 1, 2A, 2B and 3) are all those that can currently accept hazardous waste in accordance with their existing Waste Management Licence. The EA has written to all operators of landfills classified as sites that accept hazardous waste asking them to submit an application for a PPC Landfill Permit. Table 1 details the number of hazardous landfill sites expected to sub-mit PPC applications and details those that fall within DCHP (London's) area of operation.

A map showing the location of the hazardous landfill sites DCHP (London) may be asked to comment upon can be viewed at www.cirs.org.uk.
Landfill sites have been allocated tranches following a broad risk assessment, based upon information that was supplied by all landfill operators to the EA earlier in the year. The risk assessment allowed the EA to prioritise the permitting of landfill sites, with those landfill sites with potentially high risk activities being asked to submit PPC applications first.

Using the postcodes of each landfill site to identify the PCT within which each falls DCHP (London) anticipates that we may be asked to comment upon 74 of these applications on behalf of Primary Care Trusts (PCTs) and local Health Protection Units (HPUs).

According to the EA s figures issued on 3rd July 2003 hazardous landfills represent less than 40% of the landfill sites requiring PPC permits. Thus, as statutory consultees PCTs can expect to receive a significant number of landfill IPPC permit applications for review in the coming months

Health and Safety Laboratory: Biological Monitoring Team

Kate Jones, Senior Scientist, www.hsl.gov.uk

Introduction

The Biological Monitoring team has a wide range of skills and experience that we apply to help assess exposure and risk from hazardous chemicals. We have a range of modern, highly sensitive analytical instruments to help us identify and detect low concentrations of substances in blood, urine or breath. Prompt response coupled to UKAS accreditation for many meth-ods, together with good performance in external quality assurance schemes (UKNEQAS, TEQAS, DFG, FIOH) means rapid delivery of reliable results.

Assessment of exposure to toxic metals

We provide both analysis and interpretation for lead, cadmium, mercury, arsenic, chromium and more than 13 other metals and inorganic elements in blood and urine. Recent projects include arsenic and chromium exposure in timber treatment workers, speciation of arsenic, and platinum exposure in pharmacy workers.

Assessment of exposure to organics

We have well-established methods for over a hundred substances in blood, urine and breath and an active research programme developing new assays. In addition to rapid sample analysis for reactive support to HSE and others we also take part in occupational hygiene investigations and volunteer studies. We have developed a Bio-VOC breath sampler for determining expo-sure to volatile organic compounds – this has both oc-cupational and environmental applications. Current projects include organophosphate pesticide exposure in wool handlers and epoxy resin exposure in tank lining operations. A new capability in LC-MS-MS analysis has allowed analysis of incident samples for suspected insulin in a syringe and suspected chemotherapy tablets in a milk sample.

In-vitro metabolism

Most substances entering the body are changed or metabolised into something else before being excreted. The nature of the metabolites, how quickly they are formed and how much individuals vary is often poorly understood for industrial chemicals. Recent work includes studying the in vitro metabolism of diazinon and styrene.

Skin

We are currently working on a European project, jointly funded by HSE, assessing in-vitro techniques for studying dermal absorption of a range of sub-stances. The results will be used by European regulators to improve their risk assessments of hazardous substances. We are also developing databases and computer models based on published data so that using structure-activity relationships and basic physical -chemical information we can predict how a new substance will penetrate the skin. A current project is to look at penetration of chlorpyrifos through clothing onto skin.

What does the National Radiological Protection Board (NRPB) do that could help the Health Protection Agency (HPA) and management of chemical incidents?

Dr Jill Meara, Deputy Director/Public Health Physician, National Radiological Protection Board. Jill. Meara@nrpb.org

One reason for establishing the HPA is to enable sharing of skills across the whole range of health protection functions. The following paragraphs highlight some of the areas where early collaboration with other HPA functions may be mutually beneficial. NRPB employs high quality research staff in the fields of radiation biology, physics and epidemiology as applied to radiological protection. It also has scientists who work regularly, advising industry and the media.

Emergency response capabilities

NRPB has developed its own comprehensive nuclear and radiological emergency plan, scaleable to the problem, and has advised many other organisations on their own emergency arrangements. It contributes to the development and implementation of emergency exercises that involve a wide range of government bodies, local authorities and other organisations. NRPB has developed and maintains advice pertinent to emergencies – e.g. Emergency Reference Levels of dose for the introduction of countermeasures and guidance on recovery. NRPB is the co-ordinator of the National Arrangements for Incidents involving Radioactivity (NAIR).

NRPB has expertise in the design, selection and use of emergency monitoring equipment. NRPB undertakes co-ordination of monitoring resources, development of sampling/analysis protocols, assessment of the impact of accidental releases, and negotiation of complex relationships between emergency preparedness stake-holders.

Health assessments from discharges

NRPB has developed computer models to estimate the dispersion of radionuclides and corresponding concentrations in foodstuffs and other environmental materials following releases into the environment. These cover the consequences of releases in almost any situation, including normal and accidental releases to the atmospheric and aquatic environments (including sewers) from all types of sites and facilities, and releases to groundwater from landfill sites and other disposal sites for solid wastes. Data on human habitats have been collected in order to estimate the potential for human exposure. These data are used to calculate radiation doses and hence risks.

The models have been verified and validated within a formal certificated quality management system. Two of the computer models for assessing radiation doses following releases to the environment are commercially available. In principle, the models and modelling techniques could be adapted for application to chemical and a range of biological pollutants.

Environmental monitoring

Environmental monitoring and research are well developed at NRPB. Instrument surveys, sampling, radiochemical analysis and predictive modelling are used.

Geostatistical techniques, with results displayed using a geographical information system, can help to maximise the utility of measurement programmes and modelling. An example of this work is the advice given to government about the possible contamination around the Greenham Common airbase. Although this work is focused on radiological protection, the principles and philosophy can be applied more generally. Considerable emphasis is placed on the identification of the objectives and validation of any programme of environmental monitoring or research, since these determine the approach to be adopted.

Inhalation and biokinetic studies

NRPB conducts research to predict the behaviour of radionuclides that have entered the body (biokinetics) and to allow the calculation of radiation exposure. The work involves both model development and experimental research, especially on clearance of materials from the respiratory tract. The models of particle deposition in, and clearance from, the respiratory system developed for radiological protection are potentially of wide application in inhalation toxicology.

The transport of deposited particles by mechanisms such as mucociliary action is generally independent of material, and can be studied in human volunteers using nontoxic gamma-tagged tracer aerosols. NRPB has developed specialist facilities for this work. NRPB is strong in this area which arises because it can conduct experimental studies, develop models to represent radionuclide behaviour in the body, and implement the models to calculate organ retention and radiation doses.

Cellular biology and cytogenetics

NRPB has extensive expertise in cell/molecular biol-ogy, chromosomal analysis and animal sciences. This capacity is used to investigate the health effects of ionising and non-ionising radiation, particularly cancer risk but also effects on brain function. This expertise could have wider application within HPA.

Although the mechanisms and genetics of radiation and chemically-induced cancer differ, the approaches and cellular/animal models used by NRPB are also relevant to cancer risk after chemical exposures and the differences in susceptibility between individuals that are likely to apply.

NRPB has experience, essentially unique within the UK, of chromosomal analysis of blood lymphocytes to assess possible overexposure to ionising radiation. This plays a significant role in the follow-up of radiation accidents/incidents worldwide and in the coordination of associated research. The chromosomal damage induced by genotoxic chemical agents may, to a degree, be distinguished from that of ionising radiation. Therefore NRPB could play a significant role in developing HPA capacity to assess chemical exposures.

NRPB expertise in studying the behavioural effects of radiation may be relevant to other HPA research pro-grammes.

Radiation dosimetry

NRPB carries out a range of experimental and computational assessments of exposure to both ionising and non-ionising radiation.

For occupational exposure to ionising radiation, a variety of techniques are available to assess neutron and photon fields through both measurement and computation. The inhouse expertise supports the development of personal monitoring services for both neutrons and photons.

NRPB has extensive experience in the development and application of fine-resolution, anatomically realistic voxel computational models for application to specific radiological protection problems. These models are suitable for both non-ionising and ionising radiation work.

Field service provision

NRPB has built up considerable expertise in the practical issues associated with the use of both ionising and non-ionising radiation. This expertise provides a critical input to a wide range of NRPB functions and is expected to form a valuable component of the field services provision within HPA.

NRPB has a good understanding of most radiation applications with practical experience of their radiological protection issues. It provides radiological protection advisory (RPA) services to a wide range of organisations. The Health and Safety Executive has formally recognised NRPB as the first corporate RPA body.

Staff routinely assess the significance of accidents/ incidents (often abroad) and determine the actions to be taken. The geographical locations of the three NRPB establishments also ensure that all areas of the country can be reached in a maximum of about three hours. The laboratory facilities at each location enable a rapid analysis of samples.

NRPB is the primary radiological protection training organisation within the UK. It provides training courses in radiological protection to a wide range of people, including users of sources in industry and other fields, emergency response personnel and professional health physics staff at nuclear licensed sites (approximately 3000 people each year).

This training function will provide a valuable resource within HPA to give the required level of radiological protection awareness training to customers as well as to appropriate HPA staff.

NRPB offers a range of occupational dosimetry services for the assessment of personal dose. This monitoring is, in some circumstances, a legal requirement and provides information to employers on the doses their workers receive and the need for action to restrict exposure. The collective data accumulated by the dosimetry services also provide a valuable input for HSE and other organisations concerned with levels of occupational exposure in the UK. The skills in database management may be a valuable resource in HPA.

Risk communication and stakeholder involvement

NRPB deals with about 40,000 enquiries annually. It issues a range of publications for a variety of audiences. 'Living with Radiation' is a simplified summary of the science underlying radiological protection and the plain English 'At A Glance' leaflets, and corresponding web pages, cover a variety of topics. NRPB has developed material for its website that explains risk in its wider context. These resources have been designed to improve how NRPB deals with public enquiries by decreasing the need for scientific staff to answer frequently asked questions individually.

NRPB has considerable experience of website design and the practicalities of implementation. NRPB is developing ecommerce capabilities and intends to develop restricted access to specialist sites for customers. NRPB needs to understand public concerns so that research and advice can address them. Two scientific advisory groups (AGIR and AGNIR, the Advisory Groups on Ionising and Non-ionising Radiation, respectively) involve external experts in the development of NRPB scientific advice. A newer group, R,RSAG (Radiation, Risk and Society Advisory Group), develops advice for NRPB on improving communication with the public and the media. R,RSAG members are drawn from many disciplines including the media, education, sociology, medicine and engineering. NRPB organised the public open meetings of the Independent Expert Group on Mobile Phones and a recent event in Birmingham, chaired by Lord Winston, to hear public concerns about electric power transmission.

Photograph 1 in 1986 the Chernobyl explosion and fire killed 30 people and released about five percent of the radioactive reactor core into the atmosphere and downwind © NRPB

Managing victims after chemical fatalities – identification of chemicals and secondary contamination potential involved in poisoning fatalities, England and Wales, 1993-2000

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Introduction

Recent incidents of secondary chemical contamination from human fatalities[1-4] have brought to light the need for a strategic plan to effectively manage the transport, temporary storage and disposal of chemically contaminated bodies. Central to the development of a policy to effectively manage situations such as these is the identification of chemicals that pose secondary contamination hazards and how often these chemicals are associated with human fatalities. Here we present a preliminary analysis of chemically related mortalities for England and Wales from 1993 to 2000, in an attempt to identify the dominant chemical agents involved in fatal poisonings.

Mortality data for the period 1993 to 2000 were obtained from the Office of National Statistics, London and analysed to identify the prevalent chemicals involved in fatal poisonings and which of those represent a potential secondary contamination hazard. The statistics for this period are classified according to the International Classification of Diseases 9th Revision (ICD 9). Under this classification, deaths are coded according to the 'external cause' (e.g. motor vehicle accident, poisoning etc) and 'secondary cause' (e.g. skull fracture or poisoning). Chemical fatalities are largely classified under 'Toxic effects of substances chiefly non-medicinal as to source' (ICD9 codes 980-989). The more recent International Classification of Diseases 10th Revision (ICD10) coding system is used to classify mortality statistics from 2001 onwards. The reorganization and expansion of aspects of poisonings relating to non-medicinal chemicals (ICD10 codes T50 – T65) may improve future analysis of chemically related mortality statistics.

Mortality statistics relating to chemical substances

In comparison with other fatalities, deaths from poisoning by chemical substances (as opposed to pharmaceuticals or drugs of abuse) are rare. The national statistics for mortality in England and Wales over the period 1993 to 2000 indicate that chemical poisonings constitute under 0.5% of total deaths from all causes over that period. Table 1 shows the total number of deaths from toxic effects of non-medicinal substances in England and Wales for the period 1993-2000.

The majority of non-medicinal poisonings are due to carbon monoxide, accounting for almost 70% of fatalities due to non-medicinal compounds. A significant contribution is observed from the toxic effects of other gases, fumes and vapours (approximately 16%), which is largely due to smoke inhalation from fires, and alcohol (approximately 11% of the total). Comparatively, the other classifications of chemicals result in few fatalities.

A more detailed picture on the contribution of chemicals to poisoning deaths can be obtained by evaluating in greater detail the specific chemicals that are classified under the broad groups. In this case, we will ignore the contributions of smoke inhalation, carbon secondary contamination hazard. In addition, the toxic monoxide and alcohol, as they do not present a major secondary contamination hazard. In addition, the toxic effects of noxious substances eaten as food will not be considered, as these are generally due to ingestion of berries or shellfish or the like and therefore are not strictly classified as chemicals under the different classifications displayed in Table 1.

A significant number of fatalities are recorded as 'other specified', meaning that, while the substance was specified on the death certificate, it could not be grouped into any of the other classifica-

Table I: Total Deaths in England and Wales from Toxic Effects of Substances chiefly Non-medicinal as to source (ICD 980-989) 1993-2000

ICD9 Code	Toxic Effect of Chemical (Nature of Chemical)	Number of Deaths 19932000	Percentage*
980	Alcohol	1175	11.1%
982	Non-petroleum based solvents	70	0.7%
983	Corrosive aromatics, acids and caustic alkalis	66	0.6%
985	Other metals (excludes lead)	10	0.1%
986	Carbon monoxide	7318	69.7%
987	Gases/fumes/vapours (excludes carbon monoxide)	1739	16.4%
988	Noxious substances eaten as food	10	0.1%
989	Other non-medicinal substances	189	1.8%

* Approximate Percentage of Total Deaths from Toxic Effects of Substances Chiefly Non-Medicinal as to Source (ICD9 Codes 980-989) for the years 1993 to 2000. Data supplied by Office of National Statistics, London

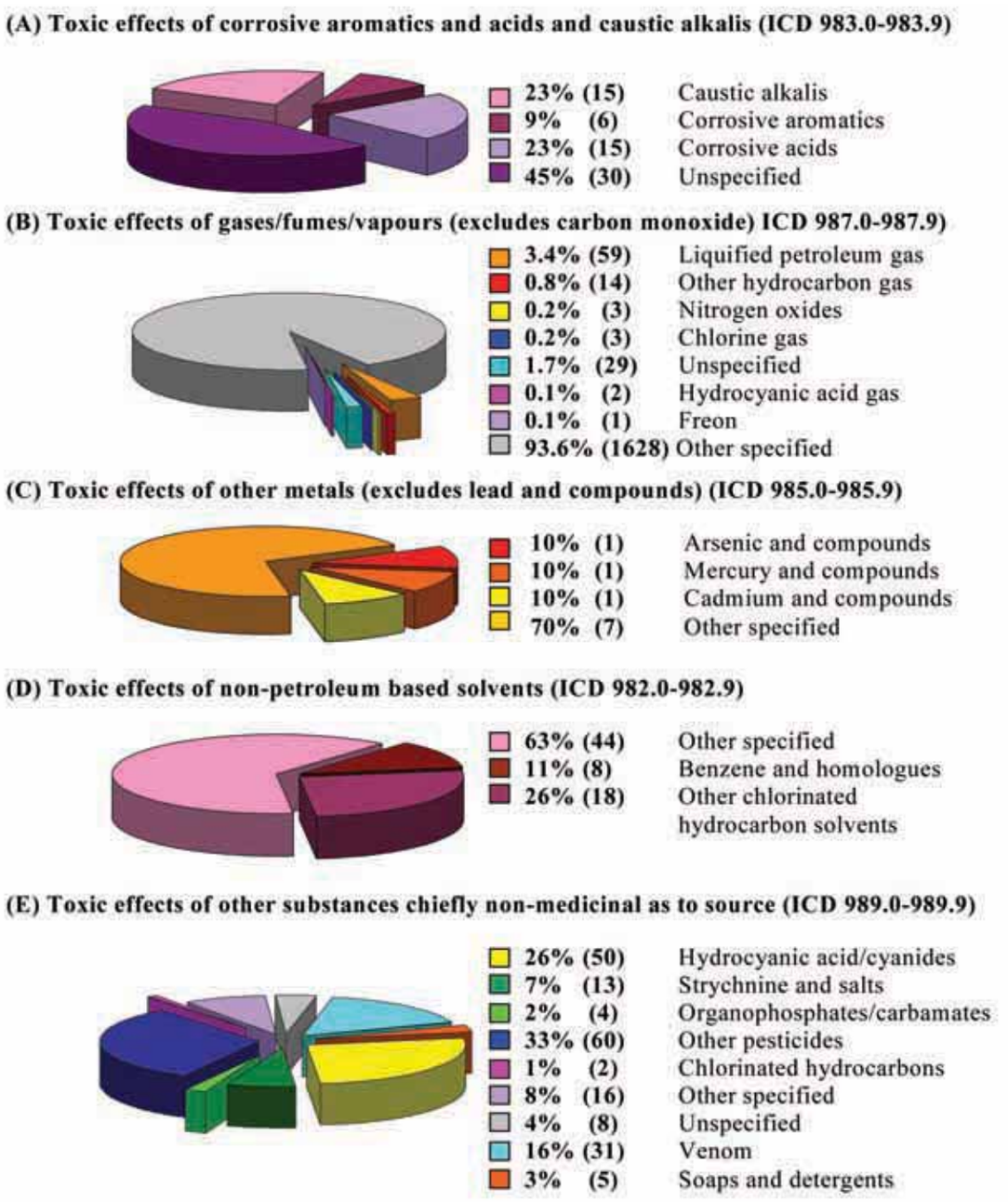

Figure 1: Fatal Chemical Poisonings and Nature of Chemicals 1993-2000

The approximate percentages shown refer to the contribution of the particular chemical to the class under which it is categorized, e.g. toxic effects of caustic alkalis contribute to 23% of the total number of fatalities as a result of toxic effects of corrosive aromatics and acids and caustic alkalis etc. The number in brackets refers to the actual number of fatal chemical poisonings recorded over the period 1993-2000 for each substance.

tions. This presents a problem when attempting to accurately identify chemicals responsible for chemical fatalities. The degree to which certain chemicals can be positively identified as causative agents in fatalities is limited under these circumstances. This presents a problem when trying to identify the major chemicals resulting in poisonings in these categories, often allowing only the identification of the broad grouping under which that chemical is catalogued. More specific information may be obtained from the coroner's reports, although there are restrictions on releasing detailed information that may allow an individual to be identified. Certain classifications have a significant proportion of chemicals not specified on death certificates (unspecified), which further hinders isolation of the key chemicals involved in certain poisonings.

Under the ICD 9 classification the dominant, identifiable non-medicinal chemicals involved in fatal poisonings in England and Wales for the period 1993 to 2000, are:

- Hydrocyanic acid/cyanides (e.g. potassium and sodium cyanides)
- Pesticides other than organophosphates or carbamates (e.g. paraquat)
- Liquefied petroleum gases

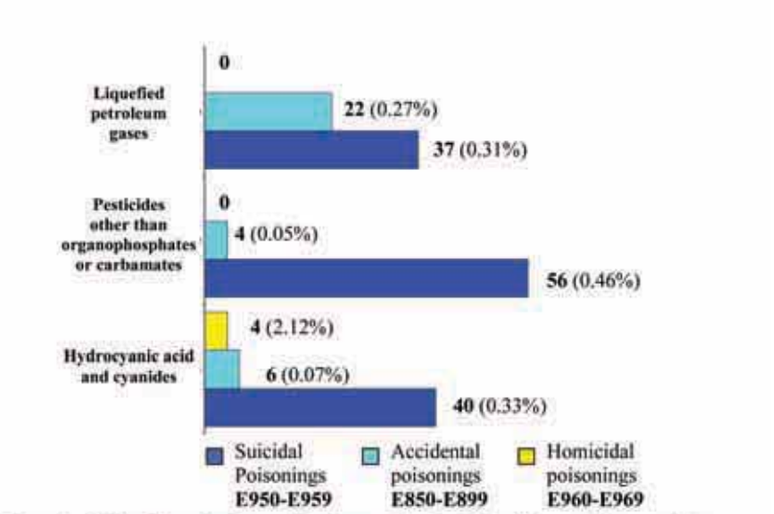

Figure 2: Major Chemicals contributing to Chemical Fatalities and External Cause

The chart indicates the external causes for poisonings due to the toxic effects of liquefied petroleum gases, non-organophosphate / non-carbamate pesticides and hydrocyanic acid and cyanides. The numbers indicate the actual number of deaths from the external cause during 1993-2000. Percentages indicate the percentage of fatalities as a function of the total poisonings for each external cause e.g. suicides from hydrocyanic acid/cyanides constitute 0.33% of total suicidal poisonings, accidents with cyanides comprise 0.07% of all accidental poisonings and homicides involving cyanides make up 2.12% of all homicidal poisonings etc.

Figure 2 highlights the fatalities from these chemicals as a function of external cause (e.g. accidental, suicidal or homicidal poisoning). In all cases the majority of fatalities associated with the toxic effects of these three chemical groups are as a result of suicides, suggesting that non-medicinal chemical substances may be most likely encountered in suicides and, to a lesser degree, accidents (although this may vary, depending on the nature and primary use of a chemical).

Chemical fatalities and secondary contamination

Secondary contamination may result in acute adverse health effects in health and emergency workers and may also result in environmental damage if the correct procedures are not taken during body disposal. Cyanides, liquefied petroleum gases and pesticides (such as the insecticide paraquat and the rodenticide aluminium phosphide, which fall under the classification of 'pesticides other than organophosphates or carbamates') may present a secondary contamination risk[5-7]. Ingestion of significant quantities of solid cyanides or aluminium phosphide result in the generation of potentially toxic quantities of hydrocyanic acid gas and phosphine gas (respectively) particularly in the acidic gastric environment[3,7]. Other non-medicinal chemicals, although they result in fewer deaths, have a high potential to cause secondary contamination. Chemicals such as mercury[8], arsenic, organophosphates/carbamates[9] and strychnine and salts, as well as volatile organic solvents could all pose secondary contamination threats[10].

The comparative rarity of these chemical fatalities with respect to all other causes of death and the quantity and variety of harmful chemicals encountered by humans may make it impossible to decisively pinpoint which chemicals are most likely to be the causative agents in human fatalities. The lack of statistical evidence at this point is not sufficient to rule out the potential of other currently unobserved chemicals from causing fatalities that result in secondary contamination. Changes in availability of certain chemicals, introduction of more stringent health and safety procedures and changes in industry will influence the statistics of chemicals responsible for fatalities. A more plausible solution may be to increase the general level of awareness of the issue, particularly for those involved in health and emergency services. Increased awareness, in conjunction with increased preparedness and defined contingency plans, are necessary to prevent secondary contamination of others and the environment.

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Reviews, meetings and course reports

REPORT REVIEW Royal Commission on Environmental Pollution (RCEP). The Royal Commission's 24th Report: Chemicals in products-Safeguarding the Environment and Human Health was published on June 26th 2003.

Maeve McParland, Senior Toxicology Information Specialist, National Poisons Information Service, London

In their news release which accompanied the publication of the report, the Commission's chairman Sir Tom Blundell, stated "Given our understanding of the way chemicals interact with the environment, you could say we are running a gigantic experiment with humans and all other living things as the subject. We think that's unacceptable".

Background to report

The publication of the report follows a two-year study initiated by the Commission in October 2000. The study focused on the long-term effects of chemicals in the environment and how these could be controlled. It was conducted in two stages:

1. scoping the topics to be included in the study: this included a literature review and a seminar inviting views from interested parties on possible alternatives to the use and control of chemicals in society;
2. seeking evidence: an invitation to submit evidence was sent to approximately 200 organisations and individuals (October 2001).

A discussion forum was also set up on the commission's website to enable those interested to contribute informal comment and these views were also fed into the first phase of the study.

Summary of concerns and proposals in report

The Commission was 'struck by how fragmented and differentiated the assessment and regulations had become and warns that the current system fails to prevent serious risks to human health and the environment. With the present system they point out that disasters of the past such as the experience with DDT are likely to be repeated.

The main concern of the commission are some 30,000 chemicals used in the European Union which they say have never been subject to any comprehensive testing to evaluate their potential risks to both humans and ecosystems. The European Commission has already proposed an approach called REACH (registration, evaluation, and authorisation of chemicals). The RCEP believes this is the right direction to be heading but that it will take much too long so have suggested interim plans. It believes that all potentially harmful chemicals can be checked fairly quickly and lays out in the proposal a means of doing this. At the current rate of assessment, testing on all the chemicals would take centuries, the RCEP claims, and that the European commission proposals would not clear this backlog in less than 50 years. Viewing this as unacceptable the RCEP chairman states that "this needs to be dealt with within a decade" and the commission proposes a means of quick checking the chemicals within three years.

Key recommendations

The report makes a total of 54 recommendations for action and change. These changes they claim will give the public more information about chemicals on the market and help achieve one of the Commissions main goals of driving producers and users of chemicals to substitute unsafe chemicals with less harmful agents. The Commission recommends that a new body the Chemicals Safety Co-ordination Unit should be established by the Government to oversee the implementation of the new programme and proposes that the Government and industry would fund the new system jointly. Resources would be transferred from existing organisations currently dealing with issues of chemical safety to the Environment agency. In addition, the commission wants users of the designated "chemicals of concern" to be subject to a financial charge, which would vary, and be graded according to the level of perceived risk of an individual chemical. As well as providing funding for the new regulatory body the charging system should also encourage the manufacture and use of less hazardous chemicals.

The new regulation would be a system consisting of four steps

1. Listing of marketed chemicals: this list would be available to the public on the internet (several countries have already adopted this approach).
2. Sorting to select chemicals of concern: using computer-based molecular modelling techniques to screen for particular biological effects, in conjunction with literature and database searching. The two main criteria used for sorting would be persistence and bioaccumulation, which they claim would reflect both exposure and hazard of the chemicals and are criteria that could be applied quickly.
3. Evaluation of selected chemicals: chemicals would be assigned to one of 3 categories of concern: high, medium, low concern or a "no concern" category. The 'no concern' category means that the chemical could continue to be used without any further testing but would remain under review.
4. Risk management action: The commission anticipates that most chemicals will fall into the 'no concern' category and may continue to be used. Those of high concern may be banned from use with lesser restrictions put on the chemicals in the medium and low concern chemicals.

Hence step two of this process would be quicker than the European commission's proposed system REACH as it would use only two toxicity assessment criteria and gather the information from existing databases rather than undertaking mammalian testing.

The RCEP acknowledge the important input of 'the layman' in previous environmental problems, citing as an example the role played by anglers in exposing the risks associated with organochlorines. The new body, they say, should welcome these opportunities for less formal monitoring. The commission believes that the public (e.g. environmental volunteer groups) have a significant role to play in monitoring for unexpected adverse effects from the chemicals in the environment.

Comment

The full report is comprehensive with many helpful 'information boxes' e.g. toxicokinetic modelling, multiple chemical sensitivity syndrome, metabolism of organic chemicals; along with figures, tables and appendices illustrating principles of current legislation and understanding of environmental pollution. It is 291 pages long (incl. 20 references pages), and a 20 page summary has also been published. Both are available in full on the Commissions website (www.rcep.org.uk) along with the interim reports from the two year study.

Meeting Reports: Annual Scientific Meeting, Faculty of Public Health Eastbourne, 24-26 June 2003

The DARE Lecture,

Virginia Murray Consultant Medical Toxicologist Chemical Hazards and Poisons Division (London)

Sir Iain Chalmers gave the DARE lecture entitled 'Beyond systematic reviews: addressing important unanswered questions'. This timely, thought provoking lecture stressed that health care professionals have done harm to people by failing to seek reliable evidence about the effects of their interventions. He pointed out that professional good intentions and plausible theories are insufficient for selecting policies and practices for protecting, promoting and restoring health. He used many examples. I summarise two.

By reviewing the guidance offered by Dr Benjamin Spock in his 'Baby and Child Care' book to place babies on their tummies to sleep, he showed that Dr Spock had failed to take into account a 1945 paper in the New York State Medical Journal which said "Watch the baby's position. Observe him at frequent intervals when he lies face down. The prone position was noticed in 68% of accidental death, ... only 17% were lying face up." How many babies might not have died if this and later evidence had been reviewed systematically?

The example of water fluoridation showed that although some countries, including the United Kingdom , continue to fluoridate water supplies other countries have abandoned this, as long ago as West Germany in 1971 and as recently as Switzerland in 2003. A systematic review of public water fluoridation was undertaken by the University of York and published in 2000. It reported that water fluoridation:

- probably reduces caries by 15%
- probably has an effect over and above toothpaste
- may possibly reduce some inequalities between social groups
- probably causes more mottled teeth than was previously thought
- may or may not cause other harms such as cancer, bone problems, etc.

However, the most serious defect of the studies of the possible effects of water fluoridation was the lack of appropriate design and analysis. Many studies did not present an analysis at all, while others did not attempt to control for potentially confounding factors. Chalmers expressed his disappointment that the recent letter sent by the Faculty and others to all MPs did not endorse the MRC's recent call for further, better research to address the uncertainties about the effects of water fluoridation.

This eloquent lecture was truly stimulating. It provided yet another opportunity to consider how public health practice should be informed by good evidence when it exists and to undertake well designed studies to clarify uncertainties.

Environmental Health Parallel Session

Patrick Saunders, Chemical Hazards and Poisons Division (Birmingham)

I had the pleasure of chairing a parallel session on environmental health at the Faculty of Public Health Scientific Meeting at Eastbourne in June. It was a lively, informative and well-attended session covering key aspects of how public health needs to be prepared for, and be able to respond to, environmental insults. The DPH and Chief EHO from Knowsley gave a joint presentation on how difficult managing community concerns about a potentially polluting process can be when that process is a major employer encouraged to locate in Merseyside as part of the region's economic strategy. There were important lessons to be learned about the tension between environmental impact, economics and public health. There were lessons too outlined by Mark Temple in his vivid description of a controversial landfill site in Wales.

One of the key themes brought out in discussion was the need for a research base to underpin the response of the NHS and the HPA. Richard Roberts and Brian Staples gave excellent presentations on a health impact assessment and potential urinary abnormalities linked to contaminated land respectively.

A major criticism of most environmental epidemiological studies is the absence of any objective exposure measure. It was therefore very interesting to hear Jackie Spiby's presentation on odours and public health hazards as smell can and has been used as a proxy for exposure.

This was the last session of a very busy 3 day programme and the level of attendance and audience participation were indicative of the quality of speakers.

Communicating the war on Terror: Royal Institution, London. 5-6 June 2003

Jim Stuart-Black BA (Hons) IDM., MICDDS

On the 5th and 6th June, The Centre for Defence Studies (Kings College London), in association with the Royal Institution hosted a two day conference entitled 'Communicating the war on Terror'. The central premise of the conference was to provide a forum for academics and practitioners to assess our response to the events of September 11th 2001 and most notably whether we are getting the balance right between being alert and being alarmed. The conference was also supported with a web dialogue function allowing continuing discussion.

There were two general themes for the conference: Day 1 was largely focused on the frequently challenging and complex issue surrounding what Governments should tell the public whilst Day 2 examined the role of the media in the war on terror. Speakers came from a wide and varied range of organisations, disciplines and countries including Britain, Israel, Germany and the United States of America. With such a wide range of attendees, the debate was challenging and often contentious.

The days were subdivided into general sessions held in the impressive Faraday Hall and subsequent workshops (with ruthless adherence to time management) in one of the many rooms within the Royal Institution. The workshops served as fertile ground to really challenge often long established beliefs and understandings of human behaviour in times of adversity.

Much debate was had throughout various workshops about the notion of panic and other abstract constructs such as trust and the perception of 'experts'. Various workshops focused on the emerging difficulties surrounding CBRN incidents and others on challenges facing emergency planning within the United Kingdom.

Central to the theme of the conference was the term 'communicating' and it is clear that whilst much excellent work has been done, there is still more to do. There is potential for complacency and a belief that we, the so-called experts know best and that intelligence and security is synonymous with secrecy. Coupled with this misdirected belief is a crass and somewhat blinkered opinion by some that the public don't need to know or they won't know what to do with the information they are given. It is absolutely right to seek a balance between issues that are of strategic importance in terms of preserving our national security and those that if properly disseminated would serve to rightly inform and educate the public. Education must surely lie at the core of this communication initiative and thus form a fundamental component in the war on terror.

The conference was a great success with many new and exciting research initiatives being mooted amongst presenters and attendees alike; indeed, almost as fascinating as the actual conference itself was the opportunity to meet with so many interested in this challenging field, thus establishing broader contacts and sources of information for the future.

Further information about the conference is available on the following web site: http://www. terrorismresearch.net

Review of the European Association of Poisons Centres and Clinical Toxicologists Conference: Rome, May 2003

Robie Kamanyire, Senior Toxicology Information Scientist, Division of Chemical Hazards and Poisons (London)

The 23rd International Congress of the European Association of Poisons Centres and Clinical Toxicologists (EAPCCT) was held between the 20-23rd of May 2003 in Rome, Italy. The annual congress is co-sponsored by the American Academy of Clinical Toxi-cologists (AACT) and brings together a diverse range of individuals, interested in toxicology, from Europe and America as well as the a significant number from the rest of the world. The conference was a great success with an interesting and stimulating scientific programme, generated by the worldwide toxicology community. The two main themes for the conference were a critical review of antidotes and occupational and environmental toxicology. Further sessions included Poison Centre activities and impacts of air pollution on health. There were numerous excellent presentations and posters with three of the most interesting summarised below.

Global surveillance for chemical incidents of international public health importance was presented by Babatunde Olowokure from the International Programme on Chemical Safety (IPCS), a division of the World Health Organisation (WHO). It is envisaged that this program will provide early warnings or alerts, and will build on an existing global alert, verification and response system for illnesses of infectious aetiology. The results from a pilot study carried out between August 2002 and November 2002 were reported. The pilot study prospectively identified chemical events on a daily basis, using criteria for screening communicable diseases of international importance developed by the WHO Global Alert and Response team, which was adapted for chemical incidents. During the 3 month pilot phase 80 events were identified; the majority 43% within the European region of WHO. The data presented reinforced the need for a global surveillance system for chemical incidents but also identified several weaknesses in the available surveillance systems, as well as geographic gaps.

Responding to terrorism: the US National Pharmaceutical Stockpile Program was presented by Susan Gorman from the Centers for Disease Control and Prevention (CDC). The US National Pharmaceutical Stock-pile (NPS) is a national repository of pharmaceuticals, vaccines, medical supplies and medical equipment that can be delivered anywhere in the US or its territories in response to a terrorism event or other public health disaster. Currently the NPS contains items useful for biological agents and chemical nerve agents, but the formulary undergoes continual validation based on research and new intelligence. The NPS is able to respond to an incident with various options including a 12 hour push package, comprised of over 90 different items, weighing 50 tons and packaged in over 100 specialised cargo containers. It is designed to arrive at an affected area within 12 hours of a federal decision to deploy. NPS assets were deployed in response to the World Trade Center attack and the anthrax attacks dur-ing the autumn of 2001. In both cases, the delivery of NPS supplies was successfully made within the 12 hour goal.

The management of an underground fire at Brynlliw Colliery waste tip was presented by Dr John Thompson from the Chemical Incident Management Support Unit (CIMSU) in Wales. The underground fire started in the colliery in 1996 and continued to burn until 1999 when remedial work was started. The colliery was located in close proximity to residential areas, including a primary school and nursing home, as well as the M4, which had to be closed on some occasions due to smoke and noxious fumes. The remediation process may have resulted in increased levels of pollutants, therefore a range of monitoring equipment was used to carry out a continuous risk assessment during remediation. Mobile analysing equipment was employed on the site to monitor levels of NOx, CO, SO2, H2S, O3 and PM10. The data was retrieved by telemetry in half hourly intervals and linked into the Cardiff Weather Centre enabling the Local Authorities to provide information to the remediation contractors and local residents on the safety of the remediation work. The use of modern technology allowed essential environmental monitoring in order that the remediation could be managed with minimum inconvenience to the local residents whilst ensuring that their health would not be put at risk.

All the abstracts from the conference have been published in the most recent issue of the Journal of Toxicology-Clinical Toxicology, Volume 41, Number 4, June 2003.

Training Day for A&E departments: Division of Chemical Hazards & Poisons (London) 22 July 2003 at Guy's Hospital

Dr Paul Crook, SpR in Public Health on secondement to Division of Chemical Hazards and Poisons (London) , Health Protection Agency

This was a Division of Chemical Hazards and Poisons (London) training day targeted specifically at A&E department staff regarding their response to the Chemical component of Chemical Biological Radiation Nuclear (CBRN) incidents. The aims were to empower A&E departments, to improve their preparedness, their awareness of available resources and to improve their understanding of the necessary interaction with other agencies. The day also focused on identifying the needs of A&E departments with regard to further training and guidance.

Professor Kevin Mackway-Jones started the first session describing the training available for incident response through MIMMS (Major Incident Medical Management and Support and SACC (Structured Ap-proach to Chemical Casualties) courses and materials. Plans to provide a unified training programme are being discussed.

An important component of the day was sharing how A&E departments have improved their local CBRN preparedness. Chemical incident training at the Royal Oldham hospital organised by Dr Simon Clarke has involved production of a training pack (including a copy of the chemical incident plan, the PPE manual and a local manual regarding the decontamination unit), a video and practical sessions with staff concern-ing the use of PPE and the decontamination tent. Staff at the Lister Hospital have organised a series of conferences to raise the level of awareness of CBRN issues for A&E staff and to help them gain confidence in addressing their own plan-ning issues. A great deal of practical experience has also been gained by live exer-cises, such as Exercise Alex at the John Radcliffe Hos-pital, Oxford. This exercise identified a series of practical issues, previously described in the Chemical Incident Report[1].

A recurring area of concern for delegates was Personal Protective Equipment (PPE). Dr Tanya Malpass described the logistical difficulties of decontaminating more than a handful of patients presenting to A&E. Precise and detailed knowledge and control of the operation, e.g. exit procedure, handover, communication and timing was required. Knowledge of the capacity and limitations of A&E decontamination was important in identifying the correct time to request assistance and to ensure that the A&E department continued to be part of the response rather than become part of the problem (see pages 30-32).
Nigel Robinson, an operational fire officer working within the newly formed Civil Resilience Directorate, discussed how the fire service would assist hospitals in mass decontamination when requested. He also described what specific mechanisms should be present in the event of a CBRN incident, including A&E emergency securing procedures and com-munications between ambulance and fire control and local hospitals.

Security in the event of a CBRN incident was a concern to A&E depart-ments. This included securing the hospital and managing patients through the decontamination process to avoid contamination of the department and allow a safe working environment for staff. It was recog-nised that the formulation of hospital plans needed to take into account that police may not be able to assist during a major incident due to other pressures. Planning needed early involvement with the security and sup-port staff e.g. porters, to identify and counter difficulties.

In a workshop led by Dr Penny Bevan from Health Protection Agency Local and Regional Services (HPA LARS) London, delegates identified a number of areas where further guidance from the HPA would be useful including; site security, when to call a CBRN incident, air-conditioning requirements for A&E departments, body-bags suitable for contaminated bodies, pro-curement of PPE suits, duration of PPE filter protection and how to decon-taminate A&E departments.

In a parallel session, Dr Nick Gent, Interim Head of Training for the Emergency Response Division of the HPA led a workshop about training. Some delegates reported that while lectures are important, exercises give the best training opportunities and many of the delegates had participat-ed in tabletop exercises.

Overall, the training day represented an opportunity for HPA and A&E staff to share practical experience and also to identify guidance, training and support needed to assist local planning. Requests for similar courses were made and feedback suggested that a further course next year may be helpful.

Reference

1. Black J. Exercise Alex: Lessons learned from a live casualty exercise involving contaminated and injured patients self-presenting to hos-pital. Chemical Incident Report 2003, 28:16-19.

Primary Care Major Incident Training, Ealing Primary Care Trust, 9 July 2003

Angela Woods, Emergency Planning Officer, Ealing Primary Care Trust & North West London Sector an-gela.woods@ealing-pct.nhs.uk

ESTAR - the Ealing Primary Care Trust protected learning time project (Ealing systematic training audit and review) recently held a workshop for GPs, Pharmacists and other primary care staff on major incident planning and response.

The aims and objectives were:

1. To gain understanding of the definition & possible contexts of major incidents within the health service i.e. 'rising tide', 'headline news', 'big bang'
2. To develop knowledge of the differing aspects of major incidents such as risk management, public health, conflicts of interest, extended scope of practice, infection control, serious untoward inci-dents, legal aspects e.g. indemnity
3. To ensure primary care staff are aware of their roles and responsibili-ties within a major incident and can apply principles of practice i.e. duty to care, confidence and competence, scope of practice, shar-ing decision making
4. To develop shared understanding of the role of primary care within the NHS at large, when working in a major incident context i.e. implementing Patient Group Directions
5. To ensure good practice within a major incident e. g. health and safety, personal safety, management of anxiety, accountability.

The event was well attended with over fifty people attending the workshop. Dr. Gouri Dhillon introduced the afternoon with Virginia Murray giving a presentation on chemical incidents. The agenda also included presentations from Craig McGowan -London Regional Health Emergency Planner, Maeve Quinn -Communications Officer Ealing PCT, Bal Hampal -Senior Pharmaceutical Adviser Ealing PCT, Philip Adamis - NHS Litigation Authority and Dr. Deepti Kumar - Consultant in Communicable Disease Control for Ealing, Hammersmith and Hounslow. The main focus of the afternoon was on how GPs and primary care staff would be affected in a major incident, how they should communicate within a major incident and what they could do in their everyday practice to ensure minimal risk. Four scenarios that looked at communicable diseases, deliberate release, chemical incidents and decontamination, were considered. The learners engaged well with the scenarios and developed com-plex possible responses.

Feedback included:

- training and protocols would be useful
- essential to have procedure for potential future incident (at our practice)
- overall event well planned and executed
- useful to have refresher training courses for staff with future worshops to discuss an appropriate emergency flowchart designed for surgeries, walk-in centres and emergency training for GP surgeries

The North West London sector hopes to roll out further training across its boundaries & thanks all involved for their hard work and successful collaboration.

Course Review: Postgraduate Diploma in Medical Toxicology, University of Wales College of Medicine, September 2002—June 2003

Oliver Morgan, Public Health Specialist Trainee, North West London Health Protection Unit

Like many public health professionals who have spent time at the Chemical Incident Response Service (now CHaPD, London), the word 'toxicology' conjures up images of huge reference books written in a mysterious language. This rather impenetrable image of toxicology is not made easier by the lack of good introductory textbooks. Therefore the Diploma in Medical Toxicology at the University of Wales College of Medicine (UCWM) seemed an ideal way of 'getting into' the subject.

The UCWM diploma is the only postgraduate toxicology course available by distance learning in the UK. The course runs for nine months from September to June. There are six modules, each lasting five weeks; Drug Safety and Pharmacovigilance; Mechanisms of Toxicity; Major Toxins; Management and Prevention of Poisoning; Occupational and Environmental Toxi-cology. The study material consists of lecture notes, selected journal articles and a tape-recorded interview with a specialist in the field. There is no face-to-face teaching although students can attend a three-day toxicology update course for health professionals. Assessment is by written assignments and case studies for each week and an exam at the end of the course.

As anybody who has done a distance learning course knows it requires a high degree of motivation. This is especially so for the Diploma where the format of study materials and weekly assignments became slightly monotonous. Furthermore, lack of contact with course tutors and delays in receiving marked assignments can feel isolating. Because the syllabus was not designed specifically for chemical incident response, some elements such as drug safety may not be directly relevant. Nevertheless the course was enjoyable and accessible for the enthusiastic 'toxicology novice' such as myself and provides a good introduction to the fun-damentals of toxicology. (for all on the on-call rota including new PCT DsPH, other generic public health practitioners, Accident and Emergency professionals, paramedics, fire and police, and environmental health) This basic one day course is an introduction to chemical incident response.
The course aims to make you 'safe' on call. Topics covered include a review of recent chemical incidents and lessons learned; sources of information, checklists and other guidance and decontamination, sheltering and evacuation and other issues. The day will include case studies and exercises. A maximum of 40 places are available.

Chemical Hazards and Poisons Division Health Protection Agency Provisional Training Days 2004

The Chemical Hazards and Poisons Division recognises that training in non-infectious environmental hazards is a priority. A programme of work is being prepared. The current plans are to continue with our training programme with flexibility to support local and regional initiatives as requested.

We summarise the provisional training days for 2004 below.

How to Respond to Chemical Incidents
Thursday 22 January 2004
Tuesday 23 March 2004
Tuesday 25 May 2004
Tuesday 26 October 2004
At Guy's Hospital
For all on the on-call rota including new PCT DsPH, other generic public health practitioners, Accident and Emergency professionals, paramedics, fire and police, and environmental health).
This basic one day course is an introduction to chemical incident response. The course aims to make you 'safe' on call. Topics covered include a review of recent chemical incidents and lessons learned; sources of information, checklists and other guidance and decontamination, sheltering and evacuation and other issues. The day will include case studies and exercises. Places are now limited on this course

IPPC Update day
Thursday 26 February 2004, Guy's Hospital
(For Directors of Public Health and their staff at Primary Care Trusts, Health Protection Agency staff undertaking IPPC assessments)
This one-day course will focus on the role of the statutory health consultee in the Integrated Pollution Prevention and Control (IPPC) permitting process. The day will include presentations and case studies of air dispersion modelling, the Environment Agency's H1 assessment tool and recent IPPC applications. A maximum of 40 places are available.

Oil Spills
Tuesday 27 April 2004, Guy's Hospital
(For Consultants in Health Protection, CsCDC, CsPHM and Specialist Registrars in Public Health Medicine and Local Authority Environmental Health Officers with shore line responsibilities).

Environmental Epidemiology
Tuesday 29 June 2004, Guy's Hospital
(For Consultants in Health Protection, CsCDC, CsPHM and Specialist Registrars in Public Health Medicine).

Key Chemicals
Tuesday 13 July 2004 at St Thomas' Hospital
(For Consultants in Health Protection, CsCDC, CsPHM and Specialist Registrars in Public Health Medicine and Local Authority Environmental Health Officers).

Contaminated Land
Tuesday 28 September 2004, Guy's Hospital
(For Consultants in Health Protection, CsCDC, CsPHM and Specialist Registrars in Public Health Medicine and Local Authority Environmental Health Officers).

Those attending CHaPD courses will receive a Certificate of Attendance and CPD/CME accreditation or points

Places will be confirmed as reserved upon a receipt of a £25 deposit to cover lunch and administration costs. For those working in organisations outside the Health Protection Agency a charge of £100 for attendance at each course will be made.

For booking information on these courses and further details please contact our training manager on 0207 771 5391

CHaPD staff are happy to participate in local training programmes. Please call Virginia Murray on 020 7771 5383 to discuss.