

Public Health Departments

On Call Pack

Chemical and Other Environmental Incidents

Introduction	2
Public Health Medicine Service - Incident/Advice Record Form	3
Incident Checklist	5
Chemical Incident: Post Acute Phase Checklist	8
Non Domestic Fire Checklist (including Asbestos)	9
Shelter and Evacuation Checklist	11
Toxic Cloud and Public Safety Zones	14
Land Contamination Checklist	15
Odour Checklist	16
Radiation Checklist – Deliberate or Accidental Releases	18
Flooding Checklist	20
Summary of Key Flooding Documents	21
Major Emergency Logbook	23
Health Protection Agency Contact Details	24
National Poisons Information Centre Contacts Details and TOXBASE	25
Resources	26
Appendix 1: Pre-nominated Lead Agencies for Different Categories of Emergency	28
Glossary	29

Checklists developed by the Health Protection Agency in the UK have been modified for the Irish setting.

This on call pack has been prepared by Dominique Crowley, Mary O’Mahony, BethAnn Roch, John Cuddihy and Gemma Leane on behalf of the CPHM Environment and Health Group. It provides guidance for public health response, including out of hours. The document updates ‘Appendix 8 Chemical Incident Emergencies, Guidance for Public Health Physicians, April 2005’ and extends to include other environmental incidents.

In relation to chemical incidents involving drinking water see the relevant checklist and algorithm in ‘Drinking Water and Health, HSE 2008’.

Work is ongoing in relation to guidelines for CBRN, IHR response and HSE protocol for cluster investigation.

This document should be read in conjunction with

- Out of Hours Emergency Public Health Medicine Service, 2009
- Major Emergency Management Framework documents
- Protocol for the investigative approach to serious animal/human health problems (EPA et al, 1997)
- EUROCAT Cluster Investigation Protocols
- Public Health action cards

Introduction

A chemical incident is defined as ‘the uncontrolled release of a toxic substance, resulting in (potential) harm to public health and the environment’ (WHO, 2009). The term ‘chemical incident’ might refer to events such as an explosion of a factory which stores or uses chemicals, contamination of the food or water supply with a chemical, an oil spill, a leak in a storage unit during transportation or an outbreak of disease that is (likely to be) associated with chemical exposure. Chemical incidents can also arise from natural sources such as volcanoes, earthquakes and forest fires (WHO, 2009).

The health effects from chemical incidents include:

- Physical injury due to accident itself
- Toxicological effects due to exposure to noxious substance (acute and chronic)
- Psychotrauma

The role of Public Health Doctors/Department in the response to a major emergency involving exposure to a non-infectious environmental hazard is to:

- Identify the population exposed (those injured; those potentially harmed who may need health surveillance; and those who are unharmed or who may experience transient effects and who need full information);
- Assess the risk to public health (both the acute and chronic toxicant effects due to exposure to a noxious substance);
- Communicate the risk and guidance to key health professionals; and
- Communicate the risk to the public to address concerns.

The call may come from the HSE Emergency Planning Officer, Chief Ambulance Officer or Principal Environmental Health Officer; County/City Manager or Director of Services; chair of the Regional Crisis Management Team as part of the interagency Major Emergency Plan.

Lead agency by incident type is specified in ‘A Framework for Major Emergency Management Appendices’, see Appendix 1.

Extract from MEM Framework, Section 5.9.2 Public Health Services

“Where an emergency results in a real or perceived threat to public health by, for example, the release of chemical, radioactive or biological agents, the contamination of water or food supplies, or the spread of contaminated flood water, it can be anticipated that there will be considerable concern among both the persons immediately affected and the wider public. In such situations, the Health Service Executive Controller should ensure that the local public health services are informed of the situation as soon as possible so that they can become involved in the response at the earliest possible stage.

Public Health Doctors can provide advice, information and re-assurance, where appropriate, to exposed individuals and communities, and can play a key role in the short term and long term monitoring and management of those exposed. They can also play an important part in dealing with queries from the media. Where appropriate, a public health specialist should join the Health Service Executive support team at the Local Coordination Centre, to provide guidance and support on public health and public information issues.”

Public Health Medicine Service – Incident/Advice Record

(Example of an incident form, Public Health Department HSE South (SE))

Time: _____ **Date:** _____

Caller Name: _____ **Phone/s:** _____

Caller Type (circle): GP HospConsultant SPHM-HPSC LocalAuth AND Other (describe)

Details of request/ Clinical details (See prompts following page):

Patient Name/Address/Phone/Occup:
CIDR No:

DOB: / /

GP/Clinician:

Clinician phone:

Notification: Yes / No

Incident Type (circle): Meningococcal; General GI outbreak; VTEC; Noro OB; Salmonella OB; TB; Seasonal flu OB; Avian flu; Legionnaires D; Flu Pandemic; Water incident; Acute chemical incident; Major emergency plan; Other: (describe)

Advice given or action taken (further details on continuation sheet/s):

Enhanced Notification Form done: Yes/No. Transferred to SMO/SPHM/CDCN (name):

SPHM/SMO/CDCN: Print Name: _____ Signature: _____
MCRN: _____

Prompts

Meningococcal D: Clinical status of case? Household contacts? Other contacts? e.g. family? kissing? Sleep over – to own house and/or case to other house? Crèche? Childminder? Party? School/class? Boy/Girlfriend? (name of friend to elicit?) Contact with known case? Men C vaccine? HCW contact?

Flu A (H1N1): Symptoms? Onset? Detail travel hx and dates? Occup? Preg? Current clinical state? If child, crèche, school, class? Contacts (incl. household; room; HCWs), incl symptoms, occup, preg?

GI Outbreak: Common event? When/Where? Other common event? How many ill? Illness-symptoms/onset/hosp? Name and contact details of those ill? GPs? Menu? Further events at venue?

VTEC: Lab confirmed? Clinical status of case? Contacts? Symptomatic? Case or contacts in risk category e.g. HCW/crèche/food handler?

Acute Chemical Incident: METHANE checklist

M - Major Emergency Plan (MEP) activated?

E – Exact location of emergency? Is it a SEVESO II site?

T – Type of incident?

H – Hazards. Chemicals released? Name (trade or generic)? UN (United Nations) or CAS (Chemical Abstract Series) number/s? Scale of spill/release (volume of tank, liquid or gas)? Direction of spill/plume?

A – Access to site. Wind anemometer? Wind speed (m/s)? Wind direction (from)?

N - Number of known casualties? Type of injury?

E – Emergency services on site – Fire? Ambulance? Gardai?

Public Health advice needed? What has already been done? Samples taken? Who informed? IRT convened?

Acute Water Incident

What? When/where? Water supply? History of supply? Recent work? Population? At risk population? Remediation? Samples? Who informed? IRT convened?

See checklist in ‘Drinking Water and Health, HSE 2008’

Incident Checklist

(Adapted from 'Health Protection Incident Response Framework' from Health Protection Scotland)

1. Initial Assessment

An incident requires a public health protection response, if:

- the incident involves a **Hazardous Substance**
And
- there is a route for **Exposure** of the public

with

- people at potential risk of **Harm** if exposed
Or
- people exhibiting **Symptoms** compatible with exposure

2. Risk Assessment

Does this pose a risk of harm to human health? Is it minor/moderate/severe?

Key information

- Incident type/hazard involved, e.g. chemical name/CAS number
- Exposure route
- Acute and chronic health effects (reported symptoms and signs)
- Vulnerable population
- Environmental test results (or symptoms/signs may indicate concentration of exposure)
- Chemical thresholds values (US Homeland Security Chemical Threshold Values Protective Action Criteria http://www.hss.energy.gov/HealthSafety/WSHP/chem_safety/teel.html)

What scale of response is required from the Public Health Department?

S O U R C E	1. Nature and type of incident <ul style="list-style-type: none">- Explosion, fire, spill- Accident, deliberate action (criminal, terrorist)
	2. Agents involved, hazard identification <ul style="list-style-type: none">- Chemical, biological, radiological, nuclear- Physical state/condition, quantity- Means of identification- What does it react with?- What does it become?- Toxicity hazard
	3. Location of the incident <ul style="list-style-type: none">- Exact location (e.g. full address, grid references)- Vicinity/neighbourhood type (e.g. urban/rural)- Vulnerabilities/receptors (e.g. people in schools, hospitals etc.)- Scale of the threat to the immediate vicinity and beyond
P A T H W A Y	4. Exposure pathway <ul style="list-style-type: none">- Air, water, soil, food, direct contact, casualties /clothing
	5. Weather conditions and plume prediction
R E C E P T O R	6. Population at Risk <ul style="list-style-type: none">- Exposed; injured or ill; seriously injured; dead- Unexposed worried-well- Employees; public; first responders; emergency department staff; primary care staff- Other vulnerable groups
	7. Exposure Assessment <ul style="list-style-type: none">- Exposure history- Biological measurements (blood, urine, breath)- Environmental measurements (air, water, food, soil)

3. Incident Response

Identify other agencies involved (including who is taking the lead/coordinating role) and action taken so far.

Review options for organising a Public Health Department response (if required):

- Advisory role only, e.g. telephone contact
- Physical presence at site – consider attending “cold” site meeting by primary response agencies with EPA +/- HSA
- Local Coordinating Centre (off site)
- Crisis Management Team

4. Risk Management

Agree the incident management structure and arrangements, including communication, with other disciplines and agencies

Consider Health Protection Measures (action to reduce the risk so far, planned, or being considered)

- Could preventative measures reduce that risk and would these outweigh any potential adverse consequences?
- Agree advice on any urgent control measures
 - Prevent exposure; Source removal: isolate or disperse source
Pathway removal: e.g. prevent volatilisation of spilled liquid or remove contaminated foodstuffs
Receptor removal: prevent exposure i.e. shelter or evacuate (see checklist for shelter/evacuation and toxic cloud)
 - Minimise ongoing exposure: decontamination
 - Prevent illness: prophylaxis
- Ongoing review of potential adverse health effects of the hazard and methods of control
- Identify additional information needed for risk assessment
- Exposure assessment: environment and biological (see post acute phase checklist)

Extract from MEM Framework, Section 5.8.3 Decontamination

The need for decontamination of individuals will be established by the On-Site Coordinator, in association with the other Controllers of Operations. The Health Service Executive has responsibility for providing clinical decontamination* and medical treatment to casualties affected by hazardous materials. The fire services have responsibility for providing other forms of physical decontamination of persons at the site. The Health Service Executive will be responsible for decontamination where required to protect health service facilities, such as hospitals, from secondary contamination. Where emergency decontamination of the public is required, the fire service may use its fire-fighter decontamination facilities, or improvised equipment may be used prior to the arrival of dedicated equipment. Where persons have to undergo this practice it should be carried out under the guidance of medical personnel. It should be noted that emergency contamination carries risks for vulnerable groups, such as the elderly and the injured.

* **clinical decontamination**, meaning medical treatment by health professionals of patients affected by or contaminated with hazardous materials.

Consider need for additional Public Health support

- In-house manpower and logistics
- Local resilience arrangements (neighbouring Departments of Public Health, CPHM Environment and Health Group)
- CHaPD HPA

Consider alerting key health and other professionals

- GPs, other medical professionals and HSE areas
- HSE Assistant National Director of Health Protection and Department of Health and Children, if appropriate
- Food Safety Authority of Ireland/Department of Agriculture, Fisheries and Food, if there is a threat to food or agriculture
- National Focal Point for Chemical Hazards/AND Health Protection if there is potential for the incident to be of International concern, under International Health Regulations (IHR)

5. Risk Communication

Rationale

- Inform and advise
- Openness
- Disclose uncertainties
- Reassurance

Communication Content from Public Health Department

Contribute to the provision of timely information to the public

- Nature of hazard and risk to the public
- Immediate and delayed health effects
- Patient criteria for seeking attention/treatment
- Special measures for key settings and vulnerable groups
- Need for decontamination or other follow-up
- Sources of advice and further information (e.g. leaflets, helpline)

Advice to local population following an incident (e.g. fire, chemical, flooding) may include:

- Preventing children playing with any debris
- Consider keeping pets indoors until clean up complete
- Do not mow lawns until clean up complete depending on safety
- Consider asking adults to wear thick plastic gloves and collect debris in gardens, etc. and place in clearly marked containers
- Do not hang out washing on clothes line during the clean-up

Public Health advice is communicated through the Major Emergency Management Framework and participation on the HSE Crisis Management Team and Interagency Local Coordination Group to

- The public
- Key health and other professionals/agencies

Public Health advice may be communicated directly to

- GPs (include out of hours services)
- EDs, ICUs, hospitals

Chemical Incident: Post Acute Phase Checklist

(Adapted from HPA 'Acute Chemical Incidents – Basic Checklist, March 2009')

Confirm that the chemical hazard initially identified is the actual chemical hazard

Identify source-pathway-receptor linkages

- Is there an aquifer used for drinking water abstraction?
- Is there a river or stream used for recreational purposes?
- Is the land used to grow food?
- Are there other contaminant transport pathways?
- Are there plastic water supply pipes?

Obtain any plume modelling (real time or after event) data

Obtain updates on incident evolution and any secondary contamination

Consider conducting a site visit to undertake detailed site assessment

- Collect maps and plans of the area
- Establish topography and direction of groundwater flow
- Collect further environmental samples
- Compare any measured concentrations with regulatory standards and any past sample results, e.g. from routine environmental sampling

Re-evaluate incident category

Ensure appropriate remedial action has been undertaken to remove source of contamination or exposure pathway

- Once confirmed, no further action required
- Go to 'post incident questions'

Undertake further assessment of health impact

- Consider whether biological sampling of sentinel cases and other exposed individuals is necessary
- Consider carrying out a questionnaire survey of all those exposed to identify any adverse health effects
- If necessary, initiate a case control study to assess health impacts
- Consider long-term follow up and monitoring of the exposed population

Post Incident Questions

Has the incident been declared over for organisations involved and are they standing down?

- Have all those affected been informed of the end of the incident?
- Have all those involved in incident management been advised of event close?

Have all those with adverse health effects fully recovered?

- Do any patients need long term follow up?
- Consider longer-term epidemiological surveillance
- Relevant public health resources for surveillance post incident include CIDR, GP Co-op OOH database (HSE-NE), Health Atlas, Eurocat, HIPE

Are all records of the incident complete and up to date?

Conduct an audit of the management of the incident

- Identify lessons learnt
- Identify necessary modifications to emergency and/or incident plans

Provide final media briefing with details of how incident has been managed, any remaining adverse health impact and any preventative actions to be taken.

Non Domestic Fire Checklist

(Adapted from HPA 'Non-Domestic Fire Checklist, October 2009')

Where is the fire?

- Is the area urban, residential, industrial or rural?
- Any motorways or major transport routes?
- Any susceptible populations e.g. hospitals, schools or nursing homes?

When did the fire start?

What is burning?

- What are the likely products of combustion from fire?
- What information is known about chemicals and their storage or building materials?
- What chemicals may be in the fire? Plastics, radioactive materials, etc?
- Is there a risk of significant spread or of explosion?
- How hot is the fire i.e. over 1,000°C or less than 1,000°C? - ask Fire Service
- What are the toxic hazards to air, water and land?

How is the fire being managed?

- Left to burn/dowsing with water or foam/other?

What are the local weather conditions?

- What is the wind direction? Is it raining? Is it sunny or cloudy?

Identify plume pathway, range and possible particulate deposition

- Is a map of the plume available? If yes ask for copy, if no ask Fire Service to request one

What is the population at risk?

What are the potential health effects of exposure?

Advice on evacuation or sheltering

- Consider informing other Departments of Public Health, local hospitals and GPs under or near to plume of need to shelter and turn off air conditioning intakes
- Refer to shelter and evacuation checklist

Other points to consider

- Contact local HSE Emergency Planning Officer to establish communication with first responders and Crisis Management Team if appropriate
- Contact CHaPD HPA for advice and information if required
- Identify affected casualties
- Consider taking biological samples from exposed cases
- Consider environmental sampling in collaboration with the local Environmental Health Service and/or the EPA
- Consider liaising with the Local Authority in relation to advice on health effects of exposure to hazardous debris during the clean-up operation

Acute hospital issues relevant to public health

- If there are casualties being treated in hospital, consider contacting Emergency Departments to discuss that they can or have:
 - Recorded all names of patients or enquiries with address and telephone numbers. Public health follow-up may be required
 - Activate plans as appropriate with the aim to minimise secondary exposure and contamination; confirm staff are using appropriate personal protective equipment
 - Remove and bag patients' clothing as soon as possible, store in a safe place away from staff and patients

- If contaminated, try to prevent any patient entering ambulances or Emergency Department without appropriate decontamination if practicable
- Assess and manage affected cases according to hazard exposure and consider taking biological samples from any affected sentinel cases
- Manage those exposed who may resist decontamination or follow-up if they have symptoms
- Check water used in decontamination is contained and disposed of safely - consider contacting the Local Authority

Information on asbestos

Asbestos is a general name given to several naturally occurring fibrous minerals that have crystallised to form long thin fibres. They are divided into two sub-groups: serpentine (chrysotile (white asbestos)), which was the most commonly used type of asbestos and amphiboles, which includes crocidolite (blue asbestos), amosite (brown asbestos), tremolite, actinolite and anthophyllite, of which crocidolite was the most commonly used. Blue and brown asbestos are considered to be the most dangerous. The importation, supply and use of white, blue and brown asbestos have been banned.

Asbestos fibres do not dissolve in water or evaporate; they are resistant to heat, fire, chemical and biological degradation and are mechanically strong. Such properties made it an ideal material for use in a number of products, including insulation material for buildings, boilers and pipes; insulating board to protect buildings and ships against fire; asbestos cement for roofing sheets and pipes. The amount and type of asbestos found in the fabric of buildings depends on the product. Crocidolite and amosite were used for lagging up to 1960s. Asbestos-cement products contain 10-15% asbestos fibre, generally chrysotile. Asbestos containing products found in fires include roof tiles and asbestos-bitumen roof coatings.

The main route of exposure of asbestos fibres is through inhalation and to a lesser extent ingestion.

Asbestos is generally not considered to be acutely toxic, as few immediate effects are observed following exposure. Short-term high level inhalation exposure to asbestos has been associated with lung cancer, mesothelioma and pleural disorders such as pleural plaques. Such effects may be observed following a latency period of approximately 30 years. Epidemiology studies have shown that chronic inhalation of all types of asbestos fibres is associated with asbestosis, pleural abnormalities, mesothelioma and lung cancer. Chrysotile (white asbestos) is recognised to be less potent regarding carcinogenicity than amosite or crocidolite.

Consider

- Advise shelter from the plume and fallout debris by remaining indoors and closing all external doors and windows
- Not all asbestos containing material will be involved in the fire
- Fibres may be entrapped in larger pieces of material and therefore not released – **the public should be warned not to step on these fragments pending the clean-up operation as this could release asbestos fibres**
- Respirable fibres will be a fraction of the total released
- Some fibres will be “denatured” at the temperatures involved
- Atmospheric dispersion and deposition (particularly from rain) will reduce concentrations
- Duration of exposure will be short
- Appropriate clean-up will significantly reduce risk of exposure

The smoke produced by the fire could be irritant to eyes and have an irritant affect on those with chest problems e.g. asthma. There should be no long-term effects associated with a brief exposure to this smoke.

References

HPA Compendium of Chemical Hazards Asbestos. Available at www.hpa.org.uk/Topics/TopicsAZ
Health Protection Scotland (2007) Guidance Note 15 Asbestos. Available at www.hps.scot.nhs.uk/

Shelter and Evacuation Checklist

(Adapted from HPA 'Sheltering or Evacuation Checklist, October 2009')

The **Fire Service** is responsible for the decision to shelter or evacuate but may request advice from HSE Public Health Medicine. Sheltering is usually the safest option.

“Where decided upon, the process of evacuation will be undertaken by An Garda Síochána, with the assistance of the other services. It is the responsibility of the Local Authorities to provide Rest Centres for evacuated populations. Where significant numbers of evacuees are involved, the Local/Regional Co-ordination Group is likely to be involved.” (Extract from MEM Framework, Section 5.9.3)

The **Gardaí** ensure effective communication with the public and other emergency services. The **HSE** provides medical assistance and may provide a help-line number. Public Health Departments are not first responders.

Questions to facilitate the sheltering/evacuation decision

Is the substance harmful to the public?

- Highly toxic/toxic/irritant/non-irritant
- Short-term/long-term effects
- Explosive/non explosive

Will the public be exposed?

- Substance contained or potential for release
- Capable of dispersal via wind, rain, etc and are public in path of projected route?
- Distance, plume height, meteorological conditions, weather conditions, wind direction (expressed as blowing from...)

Will dilution factors minimise risk?

When will the public be exposed (time of day)?

- Already exposed, imminently or not for a few hours

How long could the exposure last?

- Few minutes, hours, days, months or years

Public Health would support the recommendation to shelter-in-place in the majority of instances as:

- Short timescale usually involved – internationally major emergency planning is based on a 10 minute release scenario on the basis that either the entire contents will have vented in 10 minutes or the site operator or the fire service will manage to stop the release or put mitigation measures in place by 10 minutes
- Especially if facility is upwind
- Generally it is safer to shelter-in-place rather than go out into the toxic cloud/plume to evacuate
- Evacuation may be considered if there is advance warning of the release in an area and time in which to evacuate before the toxic cloud/plume arrives

Sheltering

Sheltering is usually the safest option. Even in a poorly sealed building, infiltration may be reduced by a factor of 10. By sealing windows and doors with wet towels and newspapers, this factor increases by 30 to 50 fold.

The shelter-in-place recommendation applies to the area downwind of an incident for a radius of 3 km and for approximately 1 hour from the time the emission has been successfully stemmed/stopped, as determined from international experience to date.

Effective public health action is facilitated by first responder action on advice to shelter/evacuation. Public health protection will depend on the Fire Services to issue advice to shelter-in-place whenever there is any emission to air involving a potentially hazardous substance. For incidents involving the emission of a potentially hazardous substance, the recommendation to shelter-in-place should be immediate.

GO IN, STAY IN, TUNE IN – advice to public

- Close windows and doors
- Minimise drafts by sealing windows/doors with paper/tape/damp towels/newspaper
- Turn off central heating
- Turn off mechanical ventilation including air conditioning
- Go to an upper floor, if possible to an interior room where ventilation is less
- Avoid bathrooms and kitchens as they tend to have higher ventilation rates
- Keep children and pets indoors
- Breathe through a wet cloth over the face if the atmosphere inside room becomes uncomfortable
- Have access to a radio and tune in to the local radio station for advice and information
- Try not to use the telephone/mobile unless absolutely vital (to prevent jamming lines)

Following a sheltering incident

- Provide post sheltering advice on airing houses

Evacuation

The Fire Service and An Garda Síochána will assess the risk and recommend on evacuation.

Situations where evacuation may be appropriate

Before an incident (precautionary)

- Risk of imminent explosion (e.g. defusing a bomb/making safe an explosive hazard)
- Small leak likely to escalate rapidly
- Release/threatened release of chemical terrorist or radioactive materials

During an incident

- Spread of fire to members of the public
- Continuing release of hazard over a prolonged period of time

After an incident

- Gross environmental contamination – this would be an interagency IRT decision

Considerations on whether to evacuate or not

Is there sufficient time to evacuate?

How long will the decision process take?

- The emergency services' response time
- Public health response time

Method being chosen to co-ordinate and inform the public?

- Door-to-door
- Via loudhailers
- Radio/TV networks
- Language barriers, the need for translators

The time of day (it is more difficult to warn people effectively at 4 a.m. than at 8 p.m.)

Time to prepare the public

- To collect clothes, medication, baby supplies, pets, money etc and to secure their homes
- Time required for the public to move

The population profile

- Number of elderly, immobile etc
- Are any residential homes/nursing homes in the affected area?
- Any people on dialysis machines, or others at special risk?

The extent of the road network

- Transport availability – private and public
- Blockage of roads – e.g. flooding or snow
- Hazardous travel conditions – e.g. fog, snow, sleet, ice etc.

Consideration of the effects on the evacuees from

- Outside temperature
- Psychological trauma/medical risk
- Cost
- How large a zone is to be evacuated?

Possible health risk to An Garda Síochána on the cordon?

Following an evacuation incident

- Provide advice on airing houses

Toxic Cloud and Public Safety Zones

Ref??

The dose of exposure is the product of the concentration of the substance by the time exposed for complete pathways of exposure. The Acute Exposure Guideline Level (AEGL) incorporates safety factors to safeguard hypersensitive individuals and is designed to be very protective.

Cold, Warm and Hot Zones

The 10-minute AEGL-3, AEGL-2 and AEGL-1 will delimit the Hot, Warm and Cold Zones respectively. The 10-minute AEGL is the default on the Areal Locations of Hazardous Atmospheres (ALOHA) software used to model the plume that results from the toxic release.

Cold Zone

- Delimits the area of public concern
- Defined by AEGL-1: the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic non-sensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure
- Contains control and command post and other support functions
- Primary action: public information
- **Public Health advice:** information only as only minor transient effects. Timely information can help to allay public anxiety and limit psychological stress.

Warm Zone

- Delimits the area where population might be included in long term surveillance or be recruited into a cohort study
- Defined by AEGL-2: the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long lasting adverse health effects or an impaired ability to escape
- Fire and ambulance services permitted in the warm zone. Gardaí maintain cordons
- Access point into Hot Zone
- Decontamination area for the emergency services
- Primary action: casualty handling
- **Public Health advice:** information as for cold zone; in addition may need advice on first aid measures or decontamination activities, as health effects may be serious and non-reversible

Hot Zone

- Delimits the population that may require the assistance of the acute medical services
- Defined by AEGL-3: the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death
- Fire service only permitted in the hot zone
- Full protective equipment and clothing required as per Hazchem Code, Chemdata
- Primary action: casualty handling
- **Public Health advice:** advice as for warm zone; in addition the population in the hot zone may need the attention of the Emergency Services

Can exposed persons or casualties contaminate others?

By definition all those who have been exposed in the Hot or Warm Zone need decontamination. For example, if they were working outside when the emission passed over – they might be advised to remove all contaminated clothing and double bag it in plastic bags; to shower and put on fresh clothing; or to irrigate their eyes; as the situation may indicate.

Register of exposed

Public Health will be interested in a register of all those exposed in the Hot or Warm Zone – for epidemiological follow-up as appropriate.

Land Contamination Checklist

(Adapted from HPA 'Chronic Land Contamination Incident Checklist, October 2009')

Identify contaminant(s) involved

Identify source of contamination

- **For acute events:** source of contamination should be easily identifiable
- **For chronic problems:** refer to historical maps/information about past activities on the site

Identify all potential pathways between contaminants and receptors

- Is there an aquifer used for drinking water abstraction?
- Is there a river or stream used for recreational purposes?
- Is the land used to grow food? Is there an allotment site? What types of food are grown in the soil?
- Are there other pathways that would transport the contaminants elsewhere?
- Are there plastic water supply pipes?

Undertake preliminary desk study

Consider carrying out a site visit

Identify population at risk

Undertake full assessment of public health impact

- Determine exposure among local residents and users of the site
- Has the wider population potentially been exposed?
- Have appropriate actions to protect public health been taken?
- Consider whether an interagency incident response team (IRT) is needed. (Refer to: EPA and Departments of Agriculture and Food, Health, Environment, Heritage and Local Government. (1997). Protocol for the investigative approach to serious animal/human health problems. Kelleher *et al* (1997). Disease Cluster Investigation Protocol)

Consider a detailed investigation

- Consider contacting CHaPD HPA for advice on exposure assessment
- Consider development of health questionnaire to assess exposure and health effects
- Consider biological sampling of exposed population if appropriate test available
- Confirm that appropriate environmental sampling to determine extent of contamination on/off site have been taken
- Include control samples to determine 'background' levels
- Consider contacting FSAI re sampling and analysis of food grown in contaminated soil
- Develop detailed conceptual site model
- Collect maps and plans of the area to show geology, hydrogeology, any underground features, utility trenches, land drains, historical land use etc
- Determine direction of groundwater flow to help predict movement of chemicals through ground

Consider providing information to the public

- Advise not to eat food grown in contaminated soil or encourage thorough washing of food prior to consumption
- Encourage thorough washing of hands following contact with the soil

Odour Checklist

(Adapted from HPA 'Odour Complaints Checklist, September 2009')

Acute Response

Our sense of smell is a valuable source of information about chemicals in the environment. For some chemicals, the fact that we can smell them is a warning to move away from the source, hence protecting ourselves from further exposure. For the vast majority of chemicals we can smell them before toxicological effects, including irritation, occurs.

Suggested Actions

In the unlikely event of significant health effects due to odour exposure then an immediate response is necessary:

- Removal from source of exposure by eliminating source
 - Is the source of the odour known?
 - If known can it be removed?
- Interrupting the exposure pathway
 - Open windows (if the odour is inside)
 - Close windows (if the odour is outside)
- Removing receptor
 - Evacuate at risk individuals to location away from odour source
 - Advise affected individuals to seek medical advice
 - Inform local GP or hospital emergency department of possible presentation of those affected

Post Incident Investigation

- Effects on health may be a matter of concern; the local population should be closely involved in any investigations at an early stage and should be kept as fully informed of developments as possible

Detailed Questions in Relation to Odour (not all may be required)

Source and Nature of the Odour

- Describe the odour, what does it smell like? (see HPA table of odour characterisation*)
- What is the strength of the odour (intensity), is it a faint, mild, strong or a very strong odour?
- Does the odour strength/intensity vary?
- Is the odour perceived to be pleasant, mildly pleasant, strongly unpleasant or very strongly unpleasant?
- When was the odour first noticed?
- Is the odour persistent or intermittent?
- Is there any temporal/seasonal variation in the odour?
- Has there been a chemical spill, accident?
- Can the source be identified? If so, where is it coming from?
- Is the odour inside/outside the building?
- Describe the environmental setting. Is it residential, industrial, commercial, a landfill site?
- Is the source a regulated activity?
 - If so, what is the activity e.g. wastewater treatment, landfill, incinerator, dry cleaners, animal renderers and who are the regulators?

Pathway

- Who first noticed the odour?
- Can everyone smell the odour?
- Where do they live in relation to the odour?
- How many people are potentially exposed to the odour?

* Refer to the HPA checklist on odour complaints for the table of odour characteristics and detection threshold levels http://www.hpa.org.uk/web/HPAwebFile/HPAweb_C/1256639817998

- What are the age(s) and sex of those exposed?
- Have “at risk” groups been identified including those in schools, hospitals, residential and nursing homes etc.?
- Has any environmental sampling taken place?
 - Who is taking the samples?
 - Is there appropriate quality control?
 - Are duplicate samples being taken and analysed by an independent organisation?
 - What are the samples being tested for, which chemicals?
- Are there any sampling results available?
 - What chemicals have been detected?
 - At what levels/concentrations?
- Is there a possibility of biological odours as well as chemical?
- Has any environmental modelling taken place?
 - Has any dispersion modelling taken place?

Receptors

- Are there any reported health symptoms in relation to the odour?
- What symptoms have been reported?
 - sore throats
 - coughing/sneezing
 - eye irritation/watering
 - nausea/vomiting
 - headaches
 - breathing difficulties
 - if other symptoms, please specify
- Have any health professionals been contacted e.g. GPs. If so, by whom and who has been contacted?
- Have there been any health effects that require medical attention?

Radiation Checklist - Deliberate or Accidental Releases

Ref??

Has a Major Incident been declared?

If yes, the following would have been alerted through the MEM Framework/CMT

- Director/s of Public Health
- HSE Emergency Planning Officer/s
- Assistant National Director of Health Protection
- Radiological Protection Institute of Ireland
- National Focal Point for Radio-Nuclear Hazards

Incident Details

- Location
- Date and time of event
- Population affected: places/groups – where/who?
- If airborne release: wind direction (expressed as blowing from...)
- What level of radiation?

Health Protection Measures

- **Follow advice from the National Emergency Plan for Nuclear Accidents (NEPNA)**
Advice may include ‘No need to take precautions/protection’. If an extended or dispersed hazard is suspected, the default public health message is shelter ‘**Go In, Stay In, Tune In**’.
- **Reduce radiation exposure**
Remember: Time, Distance, Shielding. Minimise time near source, maximise distance from source, shield people from the source. ‘No hands to mouth’ if contamination is suspected. Stable Iodine tablets only protect against radioactive iodine intake – only likely to be necessary for operating nuclear reactors, therefore not likely to be required in Ireland.
- **Contamination of skin/clothing**
 - If there are concerns about people who have gone home with radioactive contamination on skin/clothing they should be advised to place clothes in a sealed plastic bag, seal in a second bag and take a shower as normal to remove most external contamination.
 - External exposure to ionising radiation does not generally result in those exposed becoming a secondary source of radiation, apart from contaminated skin and clothing. Where a radiation source is ingested or inhaled an exposed person may be a source depending on the type of radiation.
- **Personal Protective Equipment (PPE)**
Depends on type of work undertaken. Emergency services should have their own equipment and consult their occupational health service. PPE should only be used by trained personnel. Normal infection control measures (disposable gloves, aprons and masks depending on circumstances) should prevent personal contamination and intake. PPE does not protect against external beta/gamma radiation.

Health Effects of Radiation

- Radiation exposure pathways
 - External - from direct contact with or proximity to radioactive material or other radiation source (e.g. X-ray generator)
 - Internal - from radioactive material entering the body through inhalation, ingestion or wound contamination
- Radiation types
 - Alpha - internal hazard only, stopped by a sheet of paper
 - Beta - external and internal hazard, stopped by thin sheet of plastic
 - Gamma - external and internal hazard, shielded by dense material
- Risks from radiation exposure

Radiation is carcinogenic – in general, there is a fatal cancer risk of 1 in 20,000 (0.005%) per millisievert (mSv) of ‘effective dose’ with no lower threshold. Effective dose is a measure of radiation-induced harm. It takes into account exposure of different body tissues to different types of radiation. Natural radiation exposure is typically a few millisieverts every year. Whole body doses less than 0.5 sievert are unlikely to cause symptoms. Partial body exposure may occur and lead to reduced or localised effects (e.g. skin damage, burns, ulcers).

High whole body radiation exposures delivered rapidly - effects in dose ranges

(Taken from HPA ‘Card 1: Radiation; Deliberate or Accidental Releases, Immediate Action and guidance for Public Health, December 2008’)

Less than 1 sievert <i>Usually asymptomatic</i>	1-8 sievert <i>Haematopoietic syndrome</i>	6-20 sievert <i>Gastrointestinal syndrome</i>	More than 20 sievert <i>CNS/CV syndrome</i>
<ul style="list-style-type: none"> • Symptoms mild or absent • Episodic nausea, vomiting in first 48 hours in 1-10% • Mildly depressed WBC at 2-4 weeks • No foetal effects if effective dose less than 100 mSv • Counselling needed if pregnant and effective dose more than 100 mSV 	<ul style="list-style-type: none"> • Anorexia, nausea, vomiting, fatigue: 1-4 hours after exposure, timing and severity dose related • Latent period: 2 days - 4 weeks • Bone marrow depression: leucopenia – infection; low platelets – bleeding, bruising • Serial lymphocyte counts in first 48 hours predict severity • 3-4 sievert: hair loss at 2-3 weeks • LD_{50/60} is around 4.5 sievert without treatment 	<ul style="list-style-type: none"> • Early nausea, vomiting, diarrhoea, anorexia, fatigue • Latent period: hours – 1 week • Severe gastrointestinal symptoms (fever, abdominal pain, cramps, watery diarrhoea, haemorrhage, electrolyte imbalance, dehydration) coupled with bone marrow depression • LD₁₀₀ is about 10 sievert, death usually within 2 weeks 	<ul style="list-style-type: none"> • Almost immediate projectile vomiting, explosive bloody diarrhoea, headache, collapse, confusion, loss of consciousness, agitation, burning sensation on skin • May be lucid interval (hours) • Neurological and cardiovascular symptoms predominate: convulsions, coma, hypotension, shock • Death within 2-3 days

Assessing Radiation Exposure

- High exposures (over 100 mSv) can be assessed by biodosimetry (chromosomal aberration, blood cell counts etc)
- There are two designated medical centres for treatment of radiation induced injuries; EDs in St. Vincent’s University Hospital Dublin and Cork University Hospital
- Doses from intakes can be assessed through direct body measurement (gamma emitters) or analysis of excreta coupled with bioassay
- Dose can often be assessed from modelled or measured environmental conditions

Flooding Checklist

Ref??

The **Local Authority is the lead agency**. HSE roles include the provision of welfare and medical support to displaced communities resident at local authority temporary rest centres, and identifying alternative accommodation and specialist transportation for patients who have to be moved. Public Health Departments provide advice and guidance on public health issues relative to the flood event. The public health risks associated with flooding are:

- Drowning and injury
- Psychological distress
- Carbon monoxide poisoning
- Infectious diseases
- Chemical exposure

Public Health Risk Assessment

- Identify the population concerned
- Assess the risk to public health
 - Assess the risk of exposure to chemical and microbial contamination including contaminated water, land and indoor environments
 - Identify any major events of chemical contamination
 - Registered sites with hazardous material under flood should be contacted, to determine if there is a risk of chemical contamination
 - Surveillance to be undertaken in regions affected by flooding:
 - monitor infectious diseases and health effects from exposure to environmental hazards
 - identify any emerging outbreaks of infectious disease. There is evidence that only locally endemic infectious diseases are of concern.
 - No additional immunisations required; tetanus booster recommended if it is not up to date

Risk Communication

- Communicate risk to key health and other professionals
- Advice to public may refer to (*HSE Press release 21 11 09: Public Health Advice for the General Public on Flooding and Water Usage in Cork*)
 - Disruption of mains water supply with loss of drinking water and implications for bottle-feeding babies, food preparation, hygiene and sanitation
 - Private water supplies
 - Disruption of power supply with implications for food preparation and hygiene and the risks of carbon monoxide poisoning from the use of generators
 - Cleaning up safely after floods (Leaflet: *Flooded Homes. HSE Environmental Health Service Jan 2009*)
 - Reducing health risks from exposures to contaminated flood water and residue: prevent or reduce exposure to flood water, residues and other hazards where possible, for example by preventing children playing in floodwaters
 - If exposure cannot be avoided, for example during clean-up, then good hygiene measures are advised such as hand-washing, the wearing of protective clothing, for example rubber boots, an apron and waterproof gloves. A standard face mask and goggles should be worn for scrubbing, hosing or pressure washing
 - Advice to reduce health risks from exposure to hydrocarbons, household and garden chemicals, on food and allotments contaminated by flood water
 - Provide information re the psychological aspects of coping with flooding (Leaflet: *Coping with Flooding. HSE Galway Psychology Department Nov 2009*)

Summary of Key Flooding Documents

Reference: A Framework for Major Emergency Management, Guidance Document 11, A Guide to Flood Emergencies. Available at www.mem.ie

HSE Response

- Provide assistance to other agencies in relation to provision of advice and services

Potential Public Health Issues

- Immediate:
 - Injured/dead people
 - Stranded people
 - Displacement of people; need for transport to health care, mortuary facilities, rescue, shelter, safe water, food, health services
 - Disruption/contamination of water supply
 - Contamination of flood waters
 - Disruption of Health Services
- Long term:
 - Water contamination
 - Food contamination
 - Damage to housing/buildings requiring rebuilding

Public Health Responses

- Liaise with other HSE services and other agencies
- Assess situation
- Advise
 - HSE Crisis Management Team
 - HSE responders
 - Other agencies
- Issue directions in relation to management of Public Health issues

Reference: HSE Flood Alert Guidance 18/08/2008, Issued by HSE National Office for Emergency Management

Actions for HSE Sites within Flooded Areas

- Identify locations of HSE facilities which may be prone to flooding in these areas
 - Ensure protection measures are in place in consultation with local Maintenance Officer
 - Ensure that critical data is protected and secured off site. (Power Disruption)
 - Identify and secure an alternative facility should the identified site become unusable through water damage or becomes inaccessible due to road closures
 - Ensure protocols are in place for notifying and informing staff
 - Ensure a protocol is in place for reporting of incidents to Area Manager
 - Ensure a protocol is in place for reporting of incidents to Maintenance Officer
 - Review business continuity of these sites

Actions in relation to 'at risk' clients within the affected areas

There may be a need to evacuate persons within these areas, this will be managed by An Garda Síochána and the relevant Local Authority, a register of 'at risk' clients should be developed of HSE clients who may find it difficult to evacuate due to conditions such as reduced mobility, appliance dependence, medication, or living alone.

- Identify geographical areas or communities that may be affected (local knowledge, social memory, historical data)
 - Ensure that 'at risk' persons living in these areas are identified
 - Produce an 'at risk' register for those identified (should be available if required out of hours)
 - Contact telephone number

- Contact for key holder (if applicable)
- Contact for next of kin
- Name of GP
- Special needs (if any) medication etc.

Activation

- It is envisaged that HSE services will be activated locally. In order to respond to any requests for assistance the following preparations should be undertaken
 - Each LHO Manager will initiate the response at local level
 - Ensure that an up to date contact list is available to each Manager
 - Who will be activated: Community Welfare, Public Health, Environmental Health and Counselling?
 - How will they be contacted? By telephone or a buddy system
 - When will they be activated?
 - Where will they report to?

If any HSE service activates its resources to reports of flooding it should automatically notify the Ambulance Control Centre in their area, and request that the Area Crisis Management Team are alerted, in order that support and guidance be made available.

Other Local Area Considerations

- There are a number of elements in the response which require interaction between HSE and other responding agencies. These should be clarified prior to the event to avoid confusion in a crisis
 - Identify a contact in Local Authority, with whom you can liaise with at local level
 - Ensure that you are aware of the locations of Local Authority Rest Centres
 - Does the HSE require a presence there, if so who is their contact on site?
 - Ensure that all the information collated in relation to your area, is readily available

Major Emergency Logbook

Location: _____

Type of Incident: _____

Date: _____

Lead SPHM: _____

Recognised current situation	Key issues	Strategic aims / priorities	Actions

Content redacted for online version

National Poisons Information Centre

Beaumont Hospital (7 days a week)

www.poisons.ie

Tel: 01 8379964

01 8092566

From 10pm to 8am calls to the NPIC Beaumont are automatically transferred to the UK NPIS

TOXBASE

UK National Poisons Information Service on-line clinical toxicology database.

TOXBASE is for use by HSE Public Health Departments - the usernames and passwords should be kept **confidential**.

To use TOXBASE database

Go to www.toxbase.org

[or, if temporarily unavailable: www.toxbasebackup.org]

Click on the link [Toxbase® \(Poisons information\)](#)

Enter username and password [entered in UPPER case]

Details redacted for online version

Different ways to find information on substances or products:

- Type the full name of the product/substance in the blank search box and click on the “Product search” button
- Use wildcard searching by typing an asterisk for the letters you are unsure of, e.g. *letters or letters* or *letters* and click on the “Product search” button
- Use the “Advanced search” button
- Click “Poisons Index A-Z” to scroll through monographs sorted alphabetically

WARNING - TOXBASE advise that printouts should NOT be kept for any length of time, or for "future reference". They can rapidly become out of date - going on-line each time you require advice ensures that you always get the most up to date information available.

Useful Phone Numbers

Environmental Protection Agency	053 9160600
Food Safety Authority of Ireland	01 8171300 / Redacted (OOH)
Health and Safety Authority	1890 289 389
Health Protection Surveillance Centre	01 8765300
Irish Meteorological Service (Met Éireann)	01 8064200
Radiological Protection Institute of Ireland	01 2697766

Chemical

WHO (2009), Manual for the Public Health Management of Chemical Incidents. Geneva: WHO.

HPA

<http://www.hpa.org.uk/Topics/TopicsAZ/> for

- Compendium of Chemical Hazards
- Incident Checklists

ATSDR

<http://www.atsdr.cdc.gov/substances/index.asp> for

- Minimal risk levels
- FAQs
- Public health statements
- Toxicological profiles
- Medical management guidelines for acute chemical exposures

US Homeland Security Chemical Threshold Values Protective Action Criteria

http://www.hss.energy.gov/HealthSafety/WSHP/chem_safety/teel.html

International Programme on Chemical Safety (IPCS) INCHEM

<http://www.inchem.org>

This database contains poison information monographs, chemical safety cards, environmental health criteria, IARC summaries, pesticide data sheets.

Drinking Water

HSE Drinking Water Intranet

http://hsenet.hse.ie/HSE_Central/Population_Health/Health_Protection/Drinking_Water/

HSE Internet

<http://www.hse.ie/eng/services/Publications/HealthProtection/>

Flooding

HSE Resources

http://www.hse.ie/eng/services/Find_a_Service/entitlements/Floods.html for

- Help and Advice for Flood Victims
- Information Leaflet on Flooded Homes
- Coping with Flooding

Office of Public Works

<http://www.flooding.ie/>

HPA website

<http://www.hpa.org.uk/Topics/TopicsAZ/> for Flooding – general information, guidance and leaflets

Major Emergency Management Framework

<http://www.mem.ie>

A Framework for Major Emergency Management

A Framework for Major Emergency Management - Appendices

Guidance Documents

A Guide to Flood Emergencies

A Guide to Local Co-ordination Centres

A Guide to Managing Evacuation

A Guide to Miscellaneous Issues

A Guide to Seveso Obligations

A Guide to Planning and Staging Exercises

A Guide to Preparing a Major Emergency Plan

A Guide to Risk Assessment

A Guide to Undertaking an Appraisal

A Guide to Working with the Voluntary Emergency Services

A Guide to Working with the Media

A Guide to Major Emergency Training Programmes

A Guide to Communications Systems (Technical)

Protocol Documents

A protocol for multi-agency response to Flood Emergencies

A protocol for multi-agency response to Radiological-Nuclear Emergencies

A protocol for multi-agency land based response to Marine Emergencies

A protocol for multi-agency response to Rail Related Emergencies

Radiation

Radiological Protection Institute of Ireland

<http://www.rpii.ie> for

- National Emergency Plan for Nuclear Accidents (NEPNA)
- Links to other organisations

HPA

<http://www.hpa.org.uk/Topics/TopicsAZ/> for radiation incidents, radiological (deliberate release) and radon

Rojas-Palma C. *et al* (2009). TMT Handbook: Triage, Monitoring and Treatment of people exposed to ionising radiation following a malevolent act (Chapter K Public Health Response)

<http://www.tmthandbook.org/>

Other

EPA and Departments of Agriculture and Food, Health, Environment, Heritage and Local Government. (1997). Protocol for the investigative approach to serious animal/human health problems.

Kelleher K *et al* (1997). Disease Cluster Investigation Protocol.

http://www.epa.ie/downloads/advice/general/protocol_investigation_animal_human_health6.pdf

EPA Licensed Facilities Search Page <http://www.epa.ie/Licensing/>

EPA live air monitoring sites <http://www.epa.ie/whatwedo/monitoring/air/data/>

Department of the Environment, Heritage and Local Government section on local authority links

<http://www.environ.ie/en/LocalGovernment/LocalGovernmentAdministration/>

Appendix 1: Pre-nominated Lead Agencies for Different Categories of Emergency

Extract from MEM Framework Appendix F7

Lead Agency The principal response agency that is assigned the responsibility and mandate for the coordination function

Pre-nominated Lead Agencies for Different Categories of Emergency

Emergency Incident Type	Initial Pre-nominated Lead Agency	Likely Change
Road Traffic Accident	An Garda Síochána	
Fire	Local Authority	
Hazardous Materials	Local Authority	
Train Crash	Local Authority	To An Garda Síochána when rescue phase complete
Aircraft Incident	Local Authority	To An Garda Síochána when fire-fighting/rescue phase complete
Rescue	Local Authority	
Weather Related	Local Authority	
Biological Incident	Health Services	
Open Country Search and Rescue (Lowland)	An Garda Síochána	
Open Country Search and Rescue (Mountain)	An Garda Síochána	
Public Order/Crowd Events	An Garda Síochána	
CCBRN Conventional Chemical Biological Radiological Nuclear	An Garda Síochána	Local Authority Health Service Executive Local Authority Local Authority
Accidental Explosions/ Building Collapse	Local Authority	To An Garda Síochána to investigate when search and rescue complete
Environmental/Pollution	Local Authority	
Marine Emergency Impacting On-Shore	Local Authority	
Water Rescue Inland	An Garda Síochána	

Glossary

AEGL	Acute Exposure Guideline Level
ALOHA	Areal Locations of Hazardous Atmospheres
AND	Assistant National Director
CAS	Chemical Abstract Series
CBRN	Chemical, Biological, Radiological, Nuclear
CDCN	Communicable Disease Control Nurse
CHaPD HPA	Chemical Hazards and Poisons Division, Health Protection Agency
CIDR	Computerised Infectious Disease Reporting
CMT	Crisis Management Team
CPHM	Consultant in Public Health Medicine
ED	Emergency Department
EPA	Environmental Protection Agency
FSAI	Food Safety Authority of Ireland
GP	General Practitioner
HIPE	Hospital In-Patient Enquiry
HPSC	Health Protection Surveillance Centre
HSA	Health and Safety Authority
HSE	Health Service Executive
ICU	Intensive Care Unit
IHR	International Health Regulations
IRT	Incident Response Team
MCRN	Medical Council Registration Number
MEP	Major Emergency Plan
OOH	Out Of Hours
PPE	Personal Protective Equipment
SMO	Senior Medical Officer
SPHM	Specialist in Public Health Medicine
UN	United Nations
WHO	World Health Organization