

# **Environment and Health International (online)**

**The Magazine of the International Federation of Environmental Health**

Volume 4 No. 2 2002

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## Comments by the President, Diane Evans

Environmental Health Professionals from 24 countries attended the 7<sup>th</sup> World Congress on Environmental Health in San Diego, 20-24 May 2002. The World Congress was held in conjunction with the 51<sup>st</sup> Annual Educational Symposium of the California Environmental Health Association. Opening Ceremonies were dedicated to the memory of Eric W. Foskett, the “father” of the Federation who had long planned to attend the Congress but passed away in August 2001. More than 50 exhibitors joined the over 500 attendees in general assemblies, parallel sessions, and social activities during the Congress.

Jerry Chaka, IFEH President Elect, and the delegation from the South African Institute of Environmental Health extended an invitation to everyone in San Diego to attend the next World Congress. Plan now to attend the 2004 World Congress in Durban, South Africa, which will be held 23-27 February 2004. For details of the next World Congress, contact Francois Nel, National Secretary of the South African Institute at [secretary.saieh@ifeh.org](mailto:secretary.saieh@ifeh.org)

The Federation’s Council met in San Diego to discuss and conduct IFEH business and to consider bids from the Canadian Institute of Public Health Inspectors and the Australian Institute of Environmental Health to host the 2008 World Congress. After a spirited process, the Council majority voted to award the hosting of the 2008 Congress to the Australian Institute and its proposed venue of the city of Brisbane.

Good news was reported to the Council to the effect that the Federation has been granted observer status in Codex Alimentarius, effective March 2002. The representatives of the German association, BVLK, will represent the Federation to Codex. Being part of the Codex process should help in advancing awareness of the Federation among other organizations and countries, and is a much welcomed new activity for IFEH.

An item on the Council’s agenda in San Diego was of particular interest to Council delegates and their organizations. Discussions and a vote took place on the question of whether organizations other than national environmental health associations could be accepted into full membership of the Federation. Many representatives argued strongly that their organizations had joined the Federation with the understanding that it would be composed of national associations, and that requirement should remain in effect. Other representatives urged that the criteria for full membership should be expanded to include regional or state organizations (such as the California Environmental Health Association which is an associate member of IFEH) in order to expand the Federation. A subsequent vote of the majority at the Council meeting reconfirmed the requirement that only national associations are to be accepted into full membership. It was also decided that ways to offer associate members a more direct role in the activities of the Federation should be explored. A working group was formed for this purpose. The working group chairman is Robert Bradbury of the Canadian Institute.

A new member has joined the International Federation. The addition of the Environmental Health Society of Nigeria brings the membership of the Federation to 32 national environmental health organizations. All environmental health professionals whose organization has membership in IFEH are reminded that you can help the Federation whenever you come in contact with potential new members. Talk to them about the Federation, refer them to the Federation’s website at [www.ifeh.org](http://www.ifeh.org) for more information, and let them know that their organization could be granted a trial membership for a period of one year, with no subscription fee.

Growth and stability of the Federation were among the goals of the IFEH Board of Directors (President, President Elect, Hon. Secretary, and Hon. Treasurer) when it submitted an application for funding of activities of the IFEH Europe Regional Group to the European Union under its new NGO Action Programme. The Board received a response August 2002 that the application had been denied, to the Board’s great disappointment. Funding for the activities of the Federation will be just one of the matters on the Board’s agenda at its next meeting November 2002.

I very much want to hear from all persons who are interested in the Federation and its activities. Do you have ideas for possible future activities? Have you had contact with someone representing an association or educational institution that might be a potential member or associate member? Do you know of possible funding sources for the Federation? I hope you will contact me by post or by sending email to the President through the IFEH website ( [www.ifeh.org](http://www.ifeh.org)). I very much look forward to knowing your thoughts about the Federation, whether they are complimentary or critical or suggestions for changes and new initiatives.

## **IFEH**

### **The Sustaining Subscribers Scheme**

by Mike Halls, Honorary Secretary

This scheme was the brainchild of the late Eric Foskett and was established to allow individuals to learn about the work of the Federation and to try to raise additional funds for the Federation's work programme.

In its hey-day the scheme had over 100 persons on its books and each contributed the princely sum of GB£15 per year to IFEH, so as to assist it in its endeavours. In Eric's latter days the scheme fell into decline and, of course, on his death, it essentially terminated.

The Federation Council has decided, however, that an attempt should be made to resurrect the scheme. But the scheme should not be regarded so much as a fund raising venture (although the IFEH is not averse to people contributing to its work!); but rather as a means of keeping interested individuals in touch with what IFEH is trying to achieve and how it is progressing.

The "new" scheme has been running for a few months now and those contributing are, in essence, a few of those who helped out in Eric's days. The Council feels that further efforts should be made to see if the scheme could be enlarged and this article is part of this effort.

At present there are 30 persons contributing GB £15 per year and they are located as follows:

England	14	Scotland	5
USA	3	Australia	2
Norway	2	Canada	1
Mauritius	1	New Zealand	1
Northern Ireland	1		

A quick arithmetic calculation reveals that between them, these individuals contribute GB£450 per annum, to the IFEH's coffers and this sum is in excess of the annual subscription paid by a considerable number of member organisations!!

Although these individuals cannot be regarded as members of IFEH (the Memorandum & Articles do not permit this to happen) they have the satisfaction of knowing that they are, in a small way, helping the Federation continue its forward motion. Each subscriber receives regular contact from IFEH and every year is sent a copy of the Annual Report and a copy of each magazine produced.

If the proposal for IFEH to have its own annual review produced by a commercial publisher comes to pass, all subscribers will receive a copy of that document. It is also hoped that, should there be a demand, a special section of the web site (at [www.ifeh.org](http://www.ifeh.org)) will be set up.

It can be seen that only 10 of the countries whose associations are members of IFEH have subscribers. This means that, if the other 22 countries had proportionally the same response, another 30+ persons would become subscribers. In turn this would generate another GB£450 to £500 per annum for IFEH. It would also mean another thirty or so people with a real "feel-good" attitude!

Please therefore consider joining the band of subscribers and to help you help IFEH an invitation is included in this edition.

When the Council last considered this matter it was suggested that the term "Sustaining Subscriber" was confusing and might militate against persons joining the scheme. The Council therefore has asked the Board of Directors to look at alternative names and one suggestion that has already been made is to call persons who donate money "Friends of the Federation".

If the name has been putting you off, please send your subscription and tell us by what term you would like to be known!

If you like the name, send us your GB£15 and tell us that you like being called a sustaining subscriber.

If you could not care less about the name but still want to help IFEH, send us your money anyway!

## **ALLERGY AWARENESS ALERT**

### **by Sally de la Rue Browne, RPHI**

Sally de la Rue Browne is a Registered Public Health Inspector and Food Safety Consultant with ENVIRO-FOOD CONSULTING in Vancouver, BC, Canada. As a trainer and conference speaker, Sally teaches workshops on food safety, allergy awareness, HACCP, and has spoken at conferences in the United States, England, Scotland and Sweden. She also wrote and co-produced a radio series called "Food Safety with Sally de la Rue Browne" heard across Canada.

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#### **INTRODUCTION:**

Allergies have become common worldwide, but allergy awareness has not. As environmental health professionals, are we taking an active stand in educating the public and working together with the foodservice industry to educate them on the seriousness and potential tragedy of an impending allergy attack? Consumers have the right to know. It's our responsibility to ensure consumer protection, and this paper will discuss how this can be done.

#### **PURPOSE:**

To point out the need for Allergy Awareness Programs in all foodservice operations to protect the health of the consumer in avoiding a potential allergy attack.

#### **METHOD:**

An Allergy Awareness Program was introduced into a health food catering operation, which provided a large number of meals to consumers including everything from a community Meals-on-Wheels program to in-house catering for large corporations. Staff were trained and a manual was written. The clients and staff were later surveyed to determine how "allergy aware" they had become.

#### **RESULTS:**

A local health food restaurant catering operation provided training sessions for their staff on allergy awareness using an Environmental Health Officer. Educational materials were utilized in conjunction with the training to help both staff and clients. There was a 30% increase in customers asking questions regarding food ingredients pertaining to allergic reactions. Special cooking demonstrations were also arranged. A follow-up survey after the training confirmed that the increased awareness had a positive effect on the operation.

#### **CONCLUSIONS:**

The work carried out with the Environmental Health Officer at this restaurant resulted in increased allergy awareness throughout the entire operation. By becoming allergy aware, the staff knew how to handle the allergic customer and improved their food preparation, sanitation and food storage. The Allergy Awareness Program proves that environmental health professionals need to play an active part in educating the public and foodservice operations on allergies.

If the word allergy is mentioned to most consumers, many will know what it means and know of someone in their family or friends with a food allergy. If you walk into most restaurants in Canada and explain that you are allergic to dairy products or peanuts, for example, and then ask them what steps have been taken to protect your health and ensure the food ordered is free from these allergens, some won't have a clue what you are talking about. A few will lead you straight to the Manager who will discuss with you what should be done for you. Quite a difference in responses, unfortunately.

Why should the response to an allergic consumer be taken seriously? A small segment of the population, in Canada; approximately 5 to 10 % of Canadians, have allergies. In this segment, approximately 50 people die every year from anaphylactic shock. This is the most severe allergic reaction where the body responds by releasing histamines and causing the throat and/or tongue to swell up, therefore resulting in death within 4 to 6 minutes unless adrenaline is administered.

In most restaurants in Canada, there are few if any epi or ani kits which contain the necessary anti-histamine to relieve the allergic reaction. This points out that if the allergic customer eats at the restaurant, unless he or she has an epi kit with them, then the probability that the restaurant will serve a food item containing the suspected allergen the customer reacts to can be high. For example, allergic reactions in restaurants and foodservice operations would be reduced dramatically if all the ingredients were properly listed. For example, when the label says spices, then wheat should be listed. When the label says colour, the type should be listed. E.g. Red Dye #2. Secondly, since cross-contamination plays a major role in allergic reactions, the education of staff and adherence to safe food handling practices would reduce cross-contamination, which in turn, would help reduce allergies and food borne illness. Therefore, a plan should be in place to handle the restaurant's response should a customer suffer a minor or severe allergic reaction.

A health food catering company, based in Vancouver, decided to introduce an Allergy Awareness Program into its operation. This company owned 4 stores that sold natural foods in the bakery, deli, grocery store and meals to community groups such as Lovin' Spoonful. As the Environmental Health Officer approached to train the staff, I was able to design a program that would meet their needs. In Canada, the Canadian Restaurant and Foodservices Association has an Allergy Aware Program, with posters, decals, etc. The goal here is to educate the food handler as well as notify the consumer that staff in the restaurant know how to respond appropriately when informed of possible allergies to certain foods.

This operation employs approximately 80 staff in total in the bakery and deli sections, and staff turnover and re-hiring is also routinely occurring. The educational requirements for the various positions called for FOODSAFE training, as well as knowledge on work safety practices in the workplace. The training was conducted in groups of 10 students, utilizing information about their operations with slides, videos and group case studies.

The first point to be dealt with was the definition of food allergy, food intolerance and food sensitivity:

**FOOD ALLERGY:**

An immunologic hypersensitivity resulting from the ingestion of food or food additives, usually unrelated to the amount of food ingested. Anaphylactic shock, a generalized systemic shock involving multiple organs, is the most severe reaction to a food allergy and can be life-threatening.

**FOOD INTOLERANCE:**

A physiologic response to food or food additives. An example of this is celiac disease, an intolerance to gluten.

**FOOD SENSIVITY:**

A general term implying an adverse reaction, usually mild, to an ingested food or food additive.

Many students were unclear as to what foods caused allergic reactions. They did not possess the knowledge to assess the ingredients in food, nor did they know the food groups most commonly involved. The Priority Allergen List, produced by the Canadian Restaurant and Foodservices Association, lists many common allergens. One not listed involves an allergy to yeast. Consumers with such an allergy are to avoid all sugars, fermented foods such as malt, vinegar, alcohol, peanuts, and all baked products. A discussion was held regarding the description of "yeast-free" used in the bakery. It was pointed out that the baked good, e.g. cinnamon bun, may not have yeast in it, but it still contained sugar, which meant that it had to be avoided by the customer allergic to yeast. Proper descriptive labelling is very important to prevent the customer buying foods that will cause their allergic reaction.

The common allergens are:  
 Peanuts and Peanut products  
 Tree Nuts  
 Milk and Milk products  
 Eggs and egg containing materials  
 Fish and fish products  
 Shellfish  
 Soy and soy products  
 Wheat and other gluten sources  
 Sesame seeds and sesame seed products  
 Sulphites  
 MSG

Students discussed the questions to ask their customers, and what foods could be recommended if the customer had an allergy to wheat, MSG, etc. For example, the customer was asked if he or she was allergic or had a food sensitivity. This would help staff decide the severity of the problem. Does the customer have a diet preference, need a food that is diet-related, or have an allergy? If the customer has a food preference, this is not a major concern health-wise but means that they prefer a certain food. If the customer claims the preference is diet-related, staff would ask if they must avoid certain foods, e.g. yeast, sugar, or must avoid calories, eg. high-fat foods. If the customer has an allergy, ask them if they are under Doctor's orders to avoid a specific food, or if they have allergic reactions to foods, e.g. dairy products in muffins.

Also discussed in the workshop were ways to prevent cross-contamination:

- Keep sanitized cloths available in bucket.
- Separate spoons to be used for serving foods out of the deli case.
- Store cleaning chemicals away from food.
- Keep separate cutting boards for raw foods, cooked foods, dairy products, etc.
- Change plastic gloves between tasks. Staff should wash hands frequently during the day.

Also stressed in the course was the importance for front-line staff to say the right thing. If a customer does have a severe life-threatening allergy, the information given to the front-line staff may be sent back to the kitchen or other food handlers that the customer wants to avoid that food. For example, the customer says no garlic, due to life threatening reaction, with the meal. The wait staff report to the chef allergy to garlic, and the chef only hears no garlic, but figures that the customer is being picky, so uses garlic on the order anyways. This all results in the anaphylactic shock the customer wanted to avoid by notifying the wait staff in the first place.

Most importantly, staff learned how to analyze menu items for allergens. An allergen chart was drawn up for different menu items.

For example: Whole Wheat Muffins

Ingredients	Allergens
Whole Wheat Flour	Wheat/Gluten
Baking Soda	
Baking Powder	Wheat/Corn
Milk	Dairy
Brown Sugar	Yeast
Butter	Dairy/Color
Olive Oil	
Eggs	Eggs
Dates	Sulphites
Sesame Seeds	Sesame Seed
Cinnamon	Wheat/Gluten

present in one whole-wheat muffin. Staff also learned how to change recipes to avoid certain allergens, for example, removing the sesame seed from the whole-wheat muffins to allow a seed-allergic customer to buy this muffin.

Liability was also discussed. Staff learned that they needed to respond to the Allergy Aware recipe binder to check if a certain allergen was present in the food requested by the customer. If uncertain about an ingredient, their best response was not to recommend the customer purchase the food. If the customer did not notify staff that he or she had an allergy, then the staff would not be liable if the customer reacted to food they were not supposed to eat. If the customer does request a certain food and notifies the staff that they are allergic, and due to cross contamination or mistakes, the wrong food is served and the customer enters anaphylactic shock, then the restaurant is still liable.

While staff were being trained over a 6-month period, the catering company provided educational leaflets in all their stores discussing allergies and what customers could ask for. The Allergy Aware Binder was created, which analyzed and listed all menu items and their potential allergens. Customers received these when purchasing their groceries. Also, a series of cooking demonstrations was arranged to discuss how allergic customers could prepare allergy-free foods. Topics included yeast-free diets, what foods to order in a restaurant, the dangers of cross-contamination, recipes with substitutes for dairy products, etc.

A follow-up survey was conducted of the staff, and also of customers who attended the stores. There was a 30% increase in customers asking questions regarding food ingredients pertaining to allergic reactions. Staff noticed a 50% increase in their knowledge base of allergy information when they responded to customers.

Overall, the work carried out with the Environmental Health Officer at this operation resulted in increased allergy awareness throughout the entire operation. By becoming allergy aware, the staff knew how to handle the allergic customer and improved their food preparation, sanitation and food storage. The Allergy Awareness Program proves that environmental health professionals can and need to play an active part in educating the public and foodservice operations on allergies

## **New Effective Technology to Inactivate BSE-like Agents**

**by Dr Kenneth Stewart**  
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There is keen interest in the UK and Europe in a technology which is based on a long established laboratory procedure and which has been developed and patented to effectively inactivate BSE-like agents.

The technology operates on the basis of alkaline hydrolysis and heat, the effect of which is to convert the proteins, nucleic acids and lipids of all cells and tissues, as well as infectious organisms, to a sterile aqueous solution as small peptides, amino acids, sugars and soaps. In other words the alkaline hydrolysis at elevated temperature breaks down the structure of cells, present in all living tissue including infectious micro-organisms, to a sterile solution containing the basic components of living tissue, namely amino acids and peptides (the building blocks of protein), sugars and fat. In the case of infectious agents this removes their ability to replicate and infect.

The technology is of great interest to governments in the UK, Europe and across the world because of its ability to effectively inactivate BSE-like agents and of course other infectious agents.



Research has established the efficacy of the alkaline hydrolysis at elevated temperature process and there is now an abundance of literature on the subject in the scientific journals. Much of the research has been undertaken by Dr David Taylor at the Institute for Animal Health in Edinburgh. Dr Taylor recently said "The data presented from the research into the effectiveness of alkaline hydrolysis at elevated temperatures all indicate that such processes are extremely efficient even at 100°C. Such a degree of agreement is unprecedented when compared with the data obtained from studies relating to other methodologies that have been applied to find reliable methods for inactivating TSE agents. The World Health Organisation has clearly been impressed by the data relating to hot alkali, and it now recommends hot alkali processes as a means of inactivating the CJD agent."

The alkaline hydrolysis technology is available from Waste Reduction Europe Ltd in Clydebank, Scotland. The technology comprises a tissue digester which is an insulated steam jacketed stainless steel vessel with a lid which is either manually or hydraulically clamped. The material to be processed, eg animal carcasses, is loaded into the vessel and a measured amount of sodium hydroxide or potassium hydroxide, proportional to the amount of tissue in the vessel, is automatically added after the load has been weighed by built-in load cells. An appropriate amount of water is added and the vessel is sealed pressure tight. The contents are heated while the digestion solution is continuously circulated. The digestion cycle is normally three hours at 150°C operating at more than 4 bar pressure. The tissues rapidly dissolve during the process and are hydrolysed into smaller and smaller molecules.

The digester vessel is produced in a range of sizes, from a small scale laboratory unit with a 14 kilo capacity to a 4536 kilo capacity unit designed for a number of large animal carcasses. Mobile units are also available. Vessels can be manufactured to order although the range available will satisfy most requirements.

At the end of the process cycle the liquid digestate is most effectively discharged to an anaerobic digestion process which will produce methane gas (energy). Other end products of the anaerobic digestion part of the process are the biomass which may be used as fertiliser and water which may be re-circulated. The process is an excellent example of a practical and effective waste to energy procedure.

The technology is very attractive in terms of environmental impact. There is no chimney or discharge to atmosphere nor is there any noticeable noise or smell from the operation. Europe is moving towards seriously reducing the volumes of waste being produced and this technology is way ahead of the suggested programmed reductions in that the volume of material is reduced in the process by some 97%. This clean technology is in a different league when we recall the crude burning pyres of carcasses across the UK in recent months.

The technology is claimed to be the most effective way of inactivating BSE like agents. It has been proved for example that some of these agents can survive incineration and have been found in the residue ash. The technology has the potential to answer the current crisis in the NHS relating to fears of nvCJD surviving on surgical instruments. It is known that traditional sterilisation is not fully effective in relation to nvCJD. Alkaline hydrolysis at elevated temperature is effective in this area.

The technology has application for the safe treatment of non BSE risk material and these applications will increase with the implementation of the EU Landfill Directive and the introduction of requirements to pre treat certain wastes before landfill. Poultry waste and feathers for example can be very effectively processed through the alkaline hydrolysis technology, offering an effective alternative to landfill disposal.

The technology is very cost effective. Capital and operating costs have been calculated to be substantially less than other technologies. For example the UK currently slaughters and disposes of about 900,000 over 30 month old cattle each year as part of the effort to minimise risk of BSE infection. Ireland currently exports to Europe their rendered meat and bone meal for final disposal. The difference in cost of current disposal methods and alkaline hydrolysis disposal is very considerable.

European legislation is currently being amended to include this new process and EU approval is being finalised. This will open the door to the use of alkaline hydrolysis technology for BSE risk carcasses and material as well as other infections and fallen stock. The technology is also used for the disposal of the

anatomical part of healthcare waste. The use of the technology for sterilising surgical instruments has huge potential

## **CIEH Journal of Environmental Health Research**

The CIEH has launched the Journal of Environmental Health Research with a new editorial team led by Harold Harvey of the University of Ulster

Increasingly, professionals in all disciplines are being challenged to offer proof that their practice is effective, efficient and equitable. Traditional modes of working are being scrutinised to prove their worth.

In response to such demands for proof of best practice in environmental health, a growing body of research in the discipline is being generated globally, not least in the UK and Ireland. In the recent visioning document from the Health Development Agency 'Environmental Health 2012: A key partner in delivering the public health agenda', there is a call for an enhanced research effort facilitated through the establishment of a national environmental health research agency.

Until recently, while countries such as the USA have had well established routes for disseminating research findings, we on this side of the Atlantic have been less well provided for. To help remedy this situation, the Chartered Institute of Environmental Health has now created the Journal of Environmental Health Research.

Each issue of the Journal will be published in three versions; full printed, abstracts and electronic journal. In keeping with the environmental ethos, submissions to the Journal and the peer review process will be managed electronically with no requirement for printed copies. Readers will be encouraged to adapt their literature access methods so that in course of time the electronic version will become the primary means of accessing the Journal.

*"It seems to me that the publication of the JEHR is an initiative which is both necessary and timely and I would encourage environmental health professionals and practitioners to get involved in research projects by using the opportunity which now presents itself to have their work published in the JEHR"*.

Dr Brian Hanna CBE, President, CIEH, in the 'Guest Comment' in the forthcoming issue of JEHR.

The Journal of Environmental Health Research is a peer reviewed journal which publishes original research papers, technical notes, professional evaluations and review articles covering the diverse range of topics which impact on environmental health.

The Journal provides a communications link between the diverse research communities, practitioners and managers in the field of environmental health and aims to promote research and knowledge awareness of practice-based issues and to highlight the importance of continuing research in environmental health issues.

### **THE EDITORS**

Harold D Harvey  
(Chief Editor)

Senior Lecturer and Director of the Environmental Health Protection and Safety Centre (EHPaS), Faculty of Engineering and Built Environment, University of Ulster, Fellow of the Chartered Institute of Environmental Health, Member of the Institution of Occupational Safety and Health and RSP.

### ***Paul Fleming***

Paul Fleming is Senior Lecturer in Health Promotion and Academic Co-ordinator of Public Health in the Multi-disciplinary Public Health Division of the School of Nursing, University of Ulster.

## **Associate Editors**

### **Dr Kenneth M Stewart**

Managing Consultant of Stewart Consulting (Environment and Health) and Director of Waste Reduction Europe Ltd, Honorary Fellow University of Edinburgh, Honorary Senior Clinical Lecturer, University of Glasgow, Fellow and Past President of the Royal Environmental Health Institute of Scotland and Member of the Chartered Institute of Environmental Health.

### **Martin Fitzpatrick**

Currently Principal Environmental Health Officer with Dublin City, and has held a variety of environmental health research and consultancy positions with Project Concern International, the WHO Regional Office for Europe, the Ministry of Public Health of Thailand and the Irish Department of Health and Children.

### **J Oliver Hetherington**

Lecturer and Course Director, BSc(Hons) Environmental Health, Environmental Health Protection and Safety centre (EHPaS), Faculty of Engineering and Built Environment, University of Ulster, Member of the Chartered Institute of Environmental Health and Member of the Institute of Acoustics.

## **INVITATION TO CONTRIBUTORS**

Contributions are invited on any of the diverse aspects of environmental health including occupational health and safety, environmental protection, health promotion, housing and health, noise and health, public health and epidemiology, environmental health education, food safety, environmental health management and policy, environmental health law and practice, sustainability and methodological issues arising from the design and conduct of studies.

Contributions should have the potential to improve practice through the dissemination of the results of research projects, reviews based on scholarly reflection and technical notes and professional evaluations which provide critical insights into practice issues. It is likely that most papers published will be based on work carried out as part of a research project or programme associated with an academic or other research institution.

Further details on the preparation and submission of papers can be found at [www.jehr-online.org](http://www.jehr-online.org). Papers should be submitted to

## **International Federation of Environmental Health by Hans Hohenleitner**

Since the early part of the year, IFEH has held Observer Status concerning Codex Alimentarius. The Food Group in IFEH considers their role in this observer status to involve active co-operation in the form of proposals and contributions toward the work. At the onset, the Bundesverband der Lebensmittelkontrolleure (BVLK) promised to take over the cost incurred by participating in the individual Codex meetings, provided a member of the BVLK was representing IFEH at such meeting.

The Codex Commission has numerous issues and meetings all over the world and, for this reason, in the future it will no doubt be necessary to include more working groups and member organisations of the IFEH to an increasing degree. The Codex Commission has also recognised that not only governments should be represented but also consumer organisations. Consequently, our commitment is essential for making sure that environmental professionals are also represented because we are the sole professional group that have a 'hotline' to consumers, industry and government alike.

Likewise, our members have the possibility of passing on the experience they have gained in practice and thus bring about improvement. Here, the Codex Commission could benefit from the extensive hands-on experience gathered over the years in many different countries.

As we have only had our role as observers since the early part of the year, there are naturally quite a lot of questions to be clarified, particularly regarding our work and the further line of approach in the future. We will, of course, have to establish several working groups – in particular outside of Europe – because currently activities only take place within the Europe Group.

It is our impression that our members have a keen interest in being involved in the development of standards and want, consequently, to influence their implementation in conformance with their way of thinking. In the past, it has surely been evident on a global scale that a great deal of the good ideas which were written down could not be used in practice - or merely to a small extent - and were therefore dismissed by those involved. I hope we can manage to gain the co-operation of as many colleagues and organisations as possible in view of the vast range of topics on hand. We shall take part in one of the meetings on Food Hygiene and subsequently discuss and consult on the future approach and the people who will participate. Hans Hohenleitner is planning to attend the meeting in Vancouver in October.

### **The Significance of Codex Alimentarius for Environmental Health Professionals**

Codex Alimentarius concerns a “collection of standards relating to the law on foodstuffs”. The executive body, the Codex Alimentarius Commission, was established in 1963 with the objective of determining international standards for foodstuffs, food additives and ingredients. It is a joint professional organisation of the FAO (Food and Agriculture Organisation of the UN) and the WHO (World Health Organisation). Standards that the Codex Alimentarius Commission has determined have international validity. The target of the standards is a harmonisation of the Law on Foodstuffs on an international level.

At present Codex is dealing with many subjects and some of them, just to mention a few, are: Street-vended foods, food additives and contaminants, principles of risk analysis for foods derived from modern biotechnology and traceability.

The focus of the Codex Alimentarius Programme is on protecting the health of the consumer and ensuring fair trade practices in the food trade, as well as promoting co-ordination of all food standards work undertaken by international governmental and non-governmental organisations.

Codex and science—Expert committees and consultations

From the very beginning, the Codex Alimentarius has been a science-based activity. Experts and specialists in a wide range of disciplines have contributed to every aspect of the code to ensure that its standards withstand the most rigorous scientific scrutiny. It is fair to say that the work of the Codex Alimentarius Commission, together with that of FAO and WHO in their supportive roles, has provided a focal point for food-related scientific research and investigation, and the Commission itself has become an important international medium for the exchange of scientific information about food.

The Codex Alimentarius has stimulated activity in the fields of food chemistry, food technology, food microbiology, mycology, and pesticide and veterinary drug residues. Much work is carried out in the form of collaborative studies between individual scientists, laboratories, institutes and universities and joint FAO/WHO expert committees and consultations.

## **PRINCIPLES CONCERNING THE PARTICIPATION OF INTERNATIONAL NON-GOVERNMENTAL ORGANIZATIONS IN THE WORK OF THE CODEX ALIMENTARIUS COMMISSION**

### **1. PURPOSE**

The purpose of collaboration with International Non-Governmental Organizations is to secure for the Codex Alimentarius Commission, expert information, advice and assistance from international non-governmental organizations and to enable organizations which represent important sections of public opinion and are authorities in their fields of professional and technical competence to express the views of their members and to play an appropriate role in ensuring the harmonizing of intersectoral interests among the various sectoral bodies concerned in a country, regional or global setting.

Arrangements made with such organizations shall be designed to advance the purposes of the Codex Alimentarius Commission by securing maximum cooperation from International Non-Governmental Organizations in the execution of its programme.

### **2. TYPES OF RELATIONSHIP**

Only one category of relationship shall be recognized, namely "Observer Status"; all other contacts, including working relations, shall be considered to be of an informal character.

### **3. ORGANIZATIONS ELIGIBLE FOR "OBSERVER STATUS"**

The following shall be eligible for Observer Status:

International Non-Governmental Organizations in consultative status, specialized consultative status or liaison status with FAO;

- i. International Non-Governmental Organizations having official relations with WHO; and
- ii. International Non-Governmental Organizations that:
  - a. are international in structure and scope of activity, and representative of the specialized field of interest in which they operate;
  - b. are concerned with matters covering a part or all of the Commission's field of activity;

have aims and purposes in conformity with the Statutes of the Codex Alimentarius Commission; and have a permanent directing body, authorized representatives and systematic procedures and machinery for communicating with its membership in various countries. Its members shall exercise voting rights in relation to its policies or action or shall have other appropriate mechanisms to express their views.

### **4. PROCEDURE FOR OBTAINING "OBSERVER STATUS"**

#### **4.1 INTERNATIONAL NON-GOVERNMENTAL ORGANIZATIONS HAVING STATUS OR OFFICIAL RELATIONS WITH FAO AND WHO**

"Observer status" shall be accorded to those International Non-Governmental Organizations in consultative status, specialized consultative status or liaison status with FAO or International Non-Governmental Organizations having official relations with WHO that inform the Secretary of the Codex Alimentarius Commission of their desire to participate in the work of the Commission and/or any or all of the Commission's subsidiary bodies on a regular basis. They may also request invitations to participate at specific sessions of the Commission or its subsidiary bodies on an ad hoc basis.

#### **4.2 NON-GOVERNMENTAL ORGANIZATIONS NOT HAVING STATUS OR OFFICIAL RELATIONS WITH FAO AND WHO**

Before any form of formal relationship is established with a Non-Governmental Organization, such Organization shall supply the Secretary of the Commission with the information outlined in the Annex to these Procedures. The Secretary shall transmit this information to the Directors-General of FAO and WHO. Upon confirmation that the Directors-General are satisfied that the applicant Organization is in a position to make a significant contribution in advancing the purposes of the Codex Alimentarius Commission, Observer Status shall be granted to the applicant Organization. Observer Status at specific meetings will not normally be granted to individual organizations that are members of a larger organization authorized and that intends to represent them at these meetings.

### **5. PRIVILEGES AND OBLIGATIONS**

International Non-governmental Organizations in Observer status shall have the following privileges and obligations:

#### **5.1 PRIVILEGES OF INTERNATIONAL NON-GOVERNMENTAL ORGANIZATIONS IN "OBSERVER STATUS"**

An Organization in Observer Status:

- a. shall be entitled to send an observer (without the right to vote) to sessions of the Commission, who may be accompanied by advisers; to receive from the Secretary of the Commission, in advance of the session, all working documents and discussion papers; to circulate to the Commission its views in writing, without abridgement; and to participate in discussions when invited by the Chairperson ;
- b. shall be entitled to send an observer (without the right to vote) to sessions of specified Subsidiary Bodies, who may be accompanied by advisers; to receive from the Secretaries of the Subsidiary Bodies, in advance of the session, all working documents and discussion papers; to circulate to these Bodies its views in writing, without abridgement; and to participate in discussions when invited by the Chairperson.
- c. may be invited by the Directors-General to participate in meetings or seminars on subjects organized under the Joint FAO/WHO Food Standards Programme which fall within its fields of interest, and if it does not so participate it may submit its views in writing to any such meeting or seminar;

- d. will receive documentation and information about meetings planned on subjects agreed upon with the Secretariat;
- e. may submit, under the authority of its governing body, written statements on matters before the Commission, in one of the languages of Commission, to the Secretary, who may communicate them to the Commission or the Executive Committee as appropriate.

## **5.2 OBLIGATIONS OF INTERNATIONAL NON-GOVERNMENTAL ORGANIZATIONS IN "OBSERVER STATUS"**

An Organization in Observer Status shall undertake:

- a. to cooperate fully with the Codex Alimentarius Commission for the furtherance of the objectives of the Joint FAO/WHO Food Standards Programme;
- b. in cooperation with the Secretariat, to determine the ways and means of co-ordinating activities within the scope of the Joint FAO/WHO Food Standards Programme, with a view to avoiding duplication and overlapping;
- c. to contribute, as far as possible, and at the request of the Directors-General, to the promotion of a better knowledge and understanding of the Codex Alimentarius Commission and the Joint FAO/WHO Food Standards Programme through appropriate discussions or other forms of publicity.
- d. to send to the Secretary of the Commission on an exchange basis, its reports and
- e. to keep the Secretary of the Commission informed of changes in its structure and membership, as well as of important changes in its secretariat.

## **6. REVIEW OF "OBSERVER STATUS"**

The Directors-General may terminate arrangements for Observer Status which are no longer considered necessary or appropriate in the light of changing programmes or other circumstances, and will report such action to the Commission. However, the international non-governmental organization concerned may appeal the termination of Observer Status.

An international non-governmental organization in Observer Status which has not shown any interest and has not attended any meetings during a period of four years may be deemed not to have sufficient interest to warrant the continuance of such relationship.

The Secretary shall report to the Codex Alimentarius Commission on the relations between the Codex Alimentarius Commission and international non-governmental organizations established in accordance with the present Procedures and shall provide a list of organizations granted Observer Status, with an indication of the membership that they represent.

The Commission shall periodically review these principles and procedures and shall consider, as necessary, any amendments which may seem desirable.

## **ANNEX: INFORMATION REQUIRED OF NON-GOVERNMENTAL ORGANIZATIONS REQUESTING "OBSERVER STATUS"**

- a. Official name of the organization in different languages (with initials)
- b. Full postal address, Telephone, Telex address, Facsimile and Email as appropriate
- c. Aims and subject fields (mandate) of organization, and methods of operation. (Enclose charter, constitution, by-laws, rules of procedures, etc.)
- d. Member organizations (name and address of each national affiliate, method of affiliation, giving number of members where possible, and names of principal officers. If the organization has individual members, please indicate approximate number in each country)
- e. Structure (assembly or conference; council or other form of governing body; type of general secretariat; commissions on special topics, if any; etc.)
- f. Indication of source of funding (e.g., membership contributions, direct funding, external contributions, or grants)
- g. Meetings (indicate frequency and average

attendance; send report of previous meeting, including any resolutions passed) that are concerned with matters covering all or part of the Commission's field of activity

h. Relations with other international organizations:

i. UN and organs (indicate consultative status or other relationship, if any)

j. Other international organizations

k. Expected contribution to the Joint FAO/WHO Food Standards Programme

l. Past activities on behalf of, or in relation to, the Codex Alimentarius Commission and the Joint FAO/WHO Food Standards Programme (indicate any relationship by national affiliates with the Regional Coordinating Committees and/or the National Codex Contact Points or Committees)

m. Area of activity in which participation as an observer is requested (Commission and/or Subsidiary Bodies). If more than one organization with similar interests is requesting observer status in any field of activity, such organizations will be encouraged to form themselves into a federation or association for the

purpose of participation. If the formation of such a single organization is not feasible, the application should explain why this is so.

n. Language (English, French or Spanish) in which documentation should be sent to the international non-governmental organizations

o. Name, Function and address of the person providing the information

## **Codex and the future**

It is difficult to imagine a world without the Codex Alimentarius. It has been said that if Codex did not exist, somebody would have to invent it. Consumer demand, recognition by WTO, the growing attendance at Codex meetings and the greater involvement of developing countries all point to a long and active life for the Commission.

However, Codex activities of the future will differ considerably from what they have been until now.

Scientific developments in fields relating to food, changing attitudes of consumers, new approaches to food control, changing perceptions of government and food industry responsibilities and changing food quality and safety concepts will present the Commission with new challenges and, conceivably, the need for new standards.

The consumer protection elements of the Codex Alimentarius, which are domain of the "horizontal" committees, are currently gaining in importance, while the compositional or recipe elements of individual commodity standards do not appear to attract as much interest as before. At present, interest in the quality aspects of Codex standards remains, although the importance attributed to such issues in the future will depend on community attitudes and demands.

The application of biotechnology to food processing and production of raw food materials is already under scrutiny by the Commission, which is continually examining new concepts and systems associated with food safety and the protection of consumers against health hazards.

These topical matters provide some insight into the direction that the Commission's activities are likely to take in the future. Whatever happens, it would be fair to claim that the Codex Alimentarius' contribution to the betterment of humankind is one of the finer and more extraordinary achievements of the twentieth century.

Information Codex

[http://www.codexalimentarius.net/index\\_en.stm](http://www.codexalimentarius.net/index_en.stm)

## **Developing a modular system for public health (environmental health) education at a national/international level – “A Starting Point”**

by G Morris (SCIEH), P Mackie (Lothian Health Board), Ruth Robertson (SCIEH).

### **Background**

The definition of environmental health given by WHO Europe (MacArthur & Bonnefoy, 1998), makes clear the importance of environmental health in the maintenance and improvement of public health particularly in the realm of the physical environment.

“Environmental health comprises those aspects of human health, including quality of life that are determined by physical, chemical, biological, social and psychosocial factors in the environment that can potentially affect adversely the health of present and future generations”.

The developing multi-disciplinary public health approach in the United Kingdom has resulted in environmental health practitioners being expected to participate in addressing the wider determinants of public health. In order for environmental health practitioners (and indeed all other public health practitioners), to be fully engaged in this new role it is crucial that suitable educational facilities are available which will engender in them, a more holistic approach to public health.

## **The Current Situation**

Masters level education in public health in the UK can be accessed through numerous institutions. Some courses use the title “Masters in Public Health” whilst others may result in the award of an MSc. There appears to be little uniformity in course content resulting in some bewildering choices for students seeking to improve public health skills or gain marketable credentials in the field of public health. There is a concern that some of these courses may be ill-matched to the needs of those wishing to enter public health practice.

Effective multidisciplinary working in public health is arguably more easily recognised than defined, and furnishing the disparate professional groups with the skills to capitalise on the opportunities afforded by multidisciplinary working is a significant challenge. Appropriate education is an important part of this. Most public health messages have a subtlety which makes them best assimilated at Masters level by those with some experience in the working environment. This has implications in defining the type of institutions best suited to supplying the education but also for the mechanisms of delivery.

Some general principles can be discerned. Amongst these is that educational packages offered to support multidisciplinary public health must not be about making everyone the same. They must seek to preserve the integrity of the component professions (and indeed enhance their specific skills) whilst developing a shared common knowledge and philosophy in core aspects of public health. Only in this way can the various professions reinforce a population perspective and develop the common language and understanding which will be so vital to success.

If the above aspirations are to be realised a number of questions require to be considered. These include, what would be the appropriate core content for a suite of MSc courses which sought to develop a shared understanding and knowledge? What form of educational system could support this? How could they be delivered? What form of infrastructure would be needed?

It is not the intention of this brief article to answer these, or indeed supplementary questions but hopefully, to engender some debate around these issues in the wider public health community.

One way to harness and shape education in the service of the multidisciplinary agenda may be to develop a modular system to Masters level at a national level. The principles of such a system would not differ from those which apply in any modular programme, except that this system would extend beyond the confines of a specific academic institution. The basic format would comprise core and elective modules. The core modules would provide the generic public health knowledge considered essential by the public health professions to facilitate multidisciplinary working and create a population perspective on health. These would be the same for all public health practitioners.

The elective modules would provide an extended knowledge base that could be aimed at professionals within specific areas of the public health function such as environmental health, health promotion etc.

The qualification would be awarded to those candidates who had successfully completed the requisite core and elective modules.

In addition, other Masters courses may elect to include some of these public health modules to give their students a more broad based knowledge of public health issues.

One potential mode of delivery would be the collaboration between higher education institutions to deliver core public health modules and a sharing of access to elective modules provided by a range of institutions eg environmental epidemiology, veterinary public health.

The possibility of developing such a wide “modular pool” from which students might select is worthy of consideration. However, the difficulties inherent in a system which relies on input from and co-operation of many institutions should not be under-estimated. Problems with registration, financial arrangements, IT support and assessment arrangements are only some of the issues which would need to be addressed.



Flexibility and accessibility by those in a full time employment, an absolute prerequisite for utility of any such system could only be afforded by establishing the most sophisticated arrangements for delivery of course material through distance learning.

An example of an international collaboration embodying many of the the above principles is to be found in the new MSc in Public Health Science (Food & Drinking Water) being taken forward by a collaboration of institutions headed by the the University of Hertfordshire. This degree involves core and elective modules which will be contributed by the University of Hertfordshire, the Eijkman Foundation of the University of Utrecht, Netherlands and the University of Linköping, Sweden.

If such collaborative arrangements are successful and are to be given status within the public health arena, then a suitable administrative framework requires to be created as a matter of urgency. This framework must ensure academic integrity and quality as well as relevance to the practice of public health. Crucially, its authority must be accepted by all concerned.

### **Conclusions**

Professional organisations such as the International Federation of Environmental Health have a unique and important role to play in educational developments.

The opportunity for a collaborative modular system for Masters level qualifications in public health exists , but many concessions will be required by all those involved. Progress will only result from a wide ranging debate between the many stakeholders. The debate will require to take place in a climate of co-operation and with a genuine desire to seek solutions to the inevitable problems which will arise.

The challenge for the Federation is to ensure that they are in a position to make a worthwhile contribution to such a debate.

## **INTEGRATIVE CASE STUDIES AS A TOOL FOR DEVELOPING ESSENTIAL SKILLS IN THE NEW ENVIRONMENTAL HEALTH SPECIALIST**

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### **Abstract**

Graduates in environmental health are increasingly expected to display more than just subject-specific knowledge when they enter practice. Recent reports from well informed sources, and indeed information direct from employers, suggests that the current and future practice environment requires environmental health specialists with well developed investigative and research skills, analytical and problem-solving abilities and human interface skills which allow them to communicate in different formats and at several levels, discuss and/or negotiate with other stakeholders and adapt easily to the dynamic practice environment.

Thus the environmental health undergraduate curriculum must include significant opportunities for students to develop these 'key' (or transferable) skills but without adversely effecting the acquisition of core

knowledge and academic achievement. It is not easy to achieve all these objectives and to satisfy the many stakeholders.

This paper describes how the group-based environmental health integrative case study approach can be used to provide a balanced combination of knowledge acquisition, skills development and academic achievement with the minimum of adaptation to existing curricula.

## **Introduction**

The UK Health Development Agency (HDA, 2002) has identified the key contributions to the public health agenda of future environmental health practitioners as follows: “Environmental health practitioners working with and alongside other public health professionals, will be key partners in local and national efforts to protect and improve the health and quality of life of individuals and communities and to reduce health inequalities. They will maintain a direct relationship with the general public, and apply their expertise in responding to the needs of individuals, while also tackling the wider determinants of population health by identifying, controlling and preventing current and future risks. Environmental health practitioners will play lead roles in local authority development, co-ordination and implementation of community health and well-being strategies through local strategic partnerships, and will actively contribute to the public health agenda of the NHS primary care trusts. They will also contribute to tackling public health issues at regional, national and international levels.”

With regard to the training and development necessary to make these contributions the HDA suggests: “A national training strategy for environmental health, which includes a focus on the wider public health agenda and a more holistic approach to environmental health, should be developed. This should be designed to meet future workforce capacity requirements that support and strengthen the contribution of environmental health to public health. It should also address the public health focused skills requirements of environmental health practitioners and recruits, including not only technical knowledge, but also attitudes and skills required for the effective application of such knowledge, including skills for working with the public, and for working within and leading multi-professional teams.”

In their forward looking report in 1997 the Environmental Health Commission in the UK identified similar roles for future environmental health professionals and they described the skills required of new professionals to allow them to fully contribute: “They will need to be flexible in their approach, multidisciplinary in their skills – able to see the whole picture, to see how their own function dovetails with others and vice versa. They must have the knowledge and skills to be able to involve the public in new forms of participation. Professionals will be trained to think laterally as well as technically. They will work to secure meaningful participation, to link up with organisations that previously worked in isolation and they will be a major ingredient in the delivery of an integrated and multi-disciplinary programme for a preventative approach to environmental health. Partnerships between public, private and voluntary sectors are vital. So, too is the engagement of communities and individuals within them” (CIEH, 1997).

Thus graduates in environmental health are increasingly expected to display more than just subject-specific knowledge when they enter employment. They need investigative and research skills to allow them to access essential information and apply critical thinking in the solution of an environmental health case. They will also need human interface skills to communicate in different formats and at a number of different levels

To prepare the graduate for current and future practice, the modern environmental health undergraduate curriculum should consist of a balanced combination of knowledge acquisition, skills development and academic achievement and must include significant opportunities for students to develop ‘key’ (or transferable) skills.

This balance is not easy to achieve. Vocational courses, such as environmental health undergraduate programmes, cannot operate in academic isolation and must react and adapt to the requirements of the many stakeholders; the accrediting professional body(ies), the employers, organisations providing professional training or internship, students and their parents, university management and the funding bodies. These stakeholders never meet and the level of understanding between them is often low, and conflicts of interest high. For example, whilst students and their parents may favour a less expensive three year programme, professional bodies and employers may insist on a longer course with a more detailed curriculum. A professional body may require compliance with a core curriculum designed to equip students with a large body of knowledge covering all aspects of the discipline in detail whilst university management may require a move away from this to a more 'skills development' approach. Employers commonly have an unrealistically high expectation that new graduates will have both the key skills and the body of knowledge to allow them to make a full contribution immediately on appointment as a transferable skills involves an unacceptable element of trade-off of purely academic goals and achievement. On the other hand some suggest that the development of transferable skills makes students more capable and more adaptable and thus helps them become more effective learners (Hodgkinson, 1996). Macmillan (1996) suggests that teaching methods in higher education have changed very little for hundreds of years and remain substantially 'chalk and talk' where the content is delivered wholly by the lecturer with little interaction with, or between, students. Students haven't changed their practices in lectures much over time either, he suggests. As a result of several initiatives in the UK over the past ten years educators have been forced to examine their own educational philosophy and practice and some have begun to view their students as a community of active learners, and themselves as facilitators of learning, rather than dispensers of information. have begun to view their students as a community of active learners, and themselves as facilitators of learning, rather than dispensers of information. Overall the literature supports the view that a variety of teaching methods helps to create a positive learning environment, and that case studies in particular, provide a beneficial learning experience in both the acquisition and application of knowledge and development of key skills (Klein, 1995, Lamont, 1995). In this paper we present the group-based environmental health integrative case study approach as a means of meeting the objectives of knowledge acquisition, skills development and academic achievement with the minimum of adaptation to existing curricula.

### **Defining the case study**

The term case study is applied to a wide range of learning and teaching activities, from a simple scenario requiring the learner to employ existing knowledge of a single subject at one end of the spectrum to a complex case at the other. A complex case may involve a team of learners drawing on existing knowledge, searching for new information from a range of sources, the integration of several subjects, group debate, the evaluation and application of the information to arrive at possible solutions to the case and making a determination of which solution is most appropriate taking into account a wide range of possible impacts. The goal of the case study approach is to help empower the students as independent thinkers and practitioners. An effective case study is one which inspires students to think and decide creatively, based on their existing knowledge plus that of other group members, and information drawn from carefully selected written and verbal sources.

### **Integrating case studies into the curriculum**

To achieve the learning potential of integrative case studies, case topics and methods need to be selected to meet the intended educational objectives. Careful attention needs to be given to how the case study will fit into the existing academic programme and in particular whether it will form part of the assessment or simply be used as a learning and teaching method. Cases which are used as a teaching and learning method only will probably be easier to design and allow more flexibility in delivery, but carry the disadvantage of being placed in the non-priority category by students faced with a diet of assessed elements. It is also useful when writing an integrative case study to consider the desired balance between the development of key skills and the enhancement of the student's subject-specific knowledge.

### **Cases and Case methods**

Some commentators distinguish between the 'case' and the 'case method' (Kuntz and Hessler, 1998, Merseeth, 1994) which may be a useful means of describing the variety of ways in which case studies can be used in teaching and learning.

Cases are 'descriptions of scenarios' which may be purely narrative or combinations of narrative and numerical and/or graphical data. The case study method will be based on the student-centred learning approach, underlining the pedagogic philosophy that learning is primarily a self-acquired process. The case method can be designed for a single candidate or for participation by a group of candidates.

### **The environmental health case study in undergraduate studies**

Environmental health specialists require the ability to solve or manage complex environmental health problems in partnership with all stakeholders, which could include; other health and environmental professionals, laboratory based professionals, the public, businesses and government. The environmental health specialist must apply critical thinking to the scenario viewing it from a variety of angles and viewpoints (holistically). They must be able to examine, investigate or appraise a situation with an acute awareness and appreciation of the variables, which may affect the problem and the solution. Many real cases also require communication, discussion and negotiation with other stakeholders and other professionals.

Environmental health specialists commonly spend a significant proportion of their time participating in groups. To be effective they must understand the dynamics of groups and how they can influence the total level of accomplishment. Group-based case studies facilitate the development of group work skills. This case method provides opportunities for students to experience the behavioural and managerial processes displayed in groups, such as security and protection; affiliation, esteem and identity, task achievement, member roles and status, group cohesiveness, norms, conflict resolution, negotiation, teamwork and communication (Vecchio, 1995).

### **The group-based integrative environmental health case study**

Integrative case studies are designed to simulate real scenarios and provide opportunities for students to develop problem solving skills and exercise collaborative management to arrive at solutions whilst drawing on existing knowledge and skills. Group activity integrative case studies add the elements of teamwork, group interaction, conflict, leader selection and human resource management. Assessed group activity integrative case studies include a mechanism for the assessment of group work and individual contribution.

#### ***Preferably the case should;***

be based on a real-life situation

have an input from practitioners/employers

allow candidates to draw on their background knowledge of the subject/science of the issue

require information gathering from a range of sources to arrive at conclusions

require careful analysis and interpretation to arrive at conclusions

require the application of critical thinking to arrive at conclusions

foster the development of multiple perspectives by participants

require the development of an awareness and appreciation of the variables which may affect the problem and the solution

#### **be integrative and**

- include several strands within a subject
- require an integration of these strands to arrive at conclusions
- require consideration of the synergies between the strands
- require consideration of the conflicts between possible solutions to the different strands
- require consideration of the impacts of the possible solutions

#### **The case method should**

facilitate teamwork require the development of

teamwork skills (possibly) require the selection of a leader require collaborative management

require informal communication between group members, with lecturing staff, with practitioners and other professionals require 'formal' communication of the final outcome(s)

### **The case assessment should**

provide some level of discrimination between individual and group performance  
include an element of peer assessment

### **The case study 'examination'**

The traditional essay-style examination can be a good test of knowledge and the candidates' ability to communicate ideas effectively in a time limited situation. The question can be designed to additionally test the candidate's ability to apply concepts and principles by including data to be manipulated in a certain way. The essay-style examination cannot, however, be easily adapted to assess the candidate's ability to analyse complex situations, to inter-relate different disciplines, to solve problems and make decisions and evaluate alternative courses of action and their impacts on selected parameters. The case study examination is designed to assess these abilities.

The authors have used the integrative case study examination in student assessment for several years. The case scenario is provided to the candidates about three weeks in advance giving them the opportunity to search for relevant information from any available sources which could include published papers and reports and discussions and interviews with managers, professionals, technical staff, the public and others. They may form teams to consider relevant issues and gather information. The examination case study is usually based on a real local case and a practitioner involved in the case is invited to participate in a time limited question and answer briefing session for all candidates at which the practitioner responds to questions posed by the candidates with the session moderated by a member of the academic team. On the day of the case study examination candidates may bring with them any information they have gathered. The examination write-up is then conducted as an invigilated open book situation, lasting 3 hours during which each candidate writes their individual response to the case (see Table I).

### **Conclusions**

Whilst the case study technique has been used extensively in higher education for many years and has formed part of the learning and teaching methods on several environmental health programmes, the anticipated new roles for environmental health specialists, identified in recent visioning reports, give added impetus to increased use of this method in the education and training of new environmental health specialists. Although there are limitations and constraints to the use of group-based integrative environmental health case studies in undergraduate curricula, not least of which is the significant resources required in developing the cases for learning and teaching purposes, they provide a learning environment, which is not easily created by other means. When properly developed and controlled this learning environment encourages the development of higher level thinking and analytical skills, promotes team working, provides opportunities for leadership skills development, develops time management skills, allows for interfacing with practitioners, develops investigative and communication skills and encourages active learning, all skills which are essential for the new environmental health specialist. It provides a convenient means of balancing the essentials of knowledge acquisition, skills development and academic achievement with the minimum of adaptation to existing curricula.

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## **Table 1**

### **Title**

Environmental Health Impacts of a proposed open-air rock concert in Belchester, sponsored by the Secretary of State for Northern Ireland, Ms Mo Molan MP

### **The Scenario**

You are a Senior Environmental Health Officer employed in the Environmental Health Services Department of Belchester City Council. Notice has been given to your Department that a major open-air rock concert is to take place in Harrington Jubilee Park, within the City, on Saturday 29 September. The event will commence in the early afternoon and is expected to continue into the night. 20,000 tickets are on sale for the concert. An event of this nature and size has not taken place in Belchester before. The Director of Environmental Health Services has required you to advise her in relation to the Departments co-ordination of the management and control of environmental health issues with respect to the event.

### **The Task**

You should produce a concise report for the Director, which will be presented by her to the Environmental Health Services Committee, addressing the Departments responsibilities in the management and control of environmental health aspects of the event, including the key areas of health & safety, food safety, public safety, noise and public health. The Director has stressed that all key environmental health contingencies with regard to the event should be prepared for in the report. In particular you should:

- identify the activities associated with the concert which may have environmental health implications
- identify potential environmental health issues and difficulties which may arise with regard to the above activities
- identify the legislative requirements which may apply to the above and might be used in their control
- identify the roles of other agencies who may impact on the environmental health issues and with whom the Department may have to liaise
- produce an indicative Departmental Plan of Action for the forthcoming event which will include; actions to be taken and associated timescales, likely human resource implications, anticipated environmental health control measures which may be required at the time of the event itself.

### **Key elements of the example**

*The case is intended to test the student's skills, not just in the purely 'technical' sense, but also those of analysis, prioritisation, and communication.*

*It is based on a real local scenario, an event which has already taken place and for which data was available within a local environmental health department.*

*The scenario was developed by the academic team, in close co-operation with the practitioners involved.*

*The case was introduced to students three weeks before the examination, at which time a preliminary briefing session was provided by the academic team.*

*A separate time limited question and answer briefing session was provided by a practitioner involved in the case, at which the practitioner could respond to questions posed by the students. This session was moderated by a member of the academic team.*

## **IFEH Europe by Gerry McDermott, Chairman**

One of the benefits of IFEH, and IFEH Europe in particular is that it should enable members of national organisations to communicate easily with other member organisations in different countries. At a certain level, communications are quite good. That is the case between REHIS, CIEH, & EHOA., in one part of Europe. It is also the case among the Scandinavian member organisations. There is a task however to make those contacts deeper between ordinary environmental health professionals throughout Europe. Between us we have a vast wealth of knowledge and experience. We find that while there are differences, many of the challenges are the same.

We need to share that knowledge and experience more widely. There is a need for us to reach out to those ordinary professionals and do things relevant to their professional lives, such as facilitating an easy exchange of knowledge and advice over national boundaries. Our Danish colleagues have shown us the potential by establishing the website and then establishing the Working Group on Sustainability Indicators. IFEH Europe is again looking at the possibilities of student and professional exchanges. We hope this will lead to a much greater exchange of environmental health professionals.

IFEH Europe now consists of sixteen national member organisations. Of these, ten are from European Union countries, with a further three from countries that will join the EU in the near future. Much if not most of European Environment and Health law emanates from the institutions of the EU. In order to have an influence as an international organisation; we need to interact more with these institutions. We need to make ourselves better known as an organisation to the EU. We have been represented at the European Environment and Health Committee for some years very ably by Kia Regnier. In May 2002 the EU had a consultation forum on Community Strategy on Environment and Health to which IFEH was invited to participate. Unfortunately the forum coincided with the World Congress in San Diego, however a written submission was made.

At the time of writing, the World Summit on Sustainable Development in Johannesburg was concluding with demonstrations, accusations, and argument, the normal workings of international conferences and democracy. Among the big issues were clean water and sanitation. Countries agreed to commit themselves to halve the proportion of people who lack clean water and proper sanitation by 2015. These commitments are not unreasonable. Hopefully, they will be achieved. A United States announcement of an investment of \$970 million in water projects over the next three years and a European Union announcement to engage in partnerships to meet the new goals, primarily in Africa and Central Asia backed them up. The UN received 21 other partnership initiatives in this area with at least \$20 million in extra resources. Whatever the final outcome, IFEH and in our case, IFEH Europe should have a response. This does not mean and cannot be a big response, but we should respond.

Gerry McDermott

### **IFEH Europe Group Meetings 2002.**

9<sup>th</sup>/10<sup>th</sup> February, Dublin.

22<sup>nd</sup> May, SanDiego.

28<sup>th</sup>/29<sup>th</sup> September, Lyon.

## **BIBLIOGRAPHY OF ARTICLES APPEARING IN IFEH MEMBER MAGAZINES**

Anyone wishing a copy of any of the following articles should contact me by e-mail or post with their name and address.

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### **New Zealand Journal of Environmental Health**

**Indicator Organisms and Water Quality, Stan Abbott, Senior Microbiologist & Water Quality Scientist, Institute of Food, Nutrition & Human Health, Massey University, Wellington, New Zealand**

This paper takes the form of a review of indicator organisms and marine recreational water quality monitoring. The intent is to encourage clear thought and discussion with respect to the application of indicator organism analyses and the subsequent interpretation and use of results.

### **Hazardous Environments Old and New – challenges for health protection, Professor mason Durie, Te Putahi a Toi School of Maori Studies, Massey University, Wellington, New Zealand.**

The year 2001 is important for health protection in New Zealand. Not only is it the first year in a new millennium and a new country, but it also marks a century of national health protection in New Zealand. In 1901, as a consequence of the New Zealand Public Health Act 1900, the Department of Public Health began operating as a government department. Its establishment gave the country an opportunity to develop a nation-wide approach to public health instead of relying entirely on the inconsistent and uneven efforts of local authorities and territorial health boards.

### **Public Health Risk Management plans Chris Noakes water group ESR Christchurch**

The Ministry of Health is working to introduce the principles of risk management into drinking-water supplies in New Zealand through water suppliers preparing and implementing public health risk management plans (Plans). This is expected to happen over the next five years (approximately).

### **Antibiotic resistant bacteria – are they a food hazard? John Aitken**

John is a medical laboratory scientist, and also a director of Envirolink Laboratory. Having an interest in both food testing and medical microbiology has given him a unique perspective in writing the article. The problem of antibiotic resistance of bacteria is of considerable environmental, social, and medical concern, but the precise details often escape people, yet we are all critically affected by it.

### **A Survey of Hydroponically Grown Vegetables in New Zealand – Christopher F Graham, ESR Ltd, PO Box 29-181, Ilam, Christchurch and Cliff Dawson, Southern Monitoring services Ltd, PO Box 1364, Invercargill**

A microbiological survey, undertaken for the Ministry of Health, was conducted on 291 samples of hydroponically grown vegetables from throughout New Zealand. These comprised 46 sprout samples, 114 leafy vegetable samples, and 60 herb samples directly from producers, and a further 71 sprout samples from commercial retail outlets. No pathogens were detected but *Escherichia coli* was isolated from 11.7% of the samples. 12.8 % of sprouts, 14.0% of leafy vegetables and 5.0% of herbs contained *E. coli*. This indicates that there is a potential risk of the three categories of hydroponically grown vegetables harbouring a pathogen. A questionnaire was designed and administered to assess whether practices and processes were appropriate for safe production of hydroponically grown sprouts. Results showed that there was considerable scope for improving the implementation of control measures based on HACCP.

### **Substandard Housing. The Implications for Health – Rodney Giddens, Health Protection Officer, Tauranga**

Substandard Housing can mean different things to different people. Talk of using the Building Act 1991 (BA), can give the impression that compliance with the Building Code is the main concern, such as lintel sizes and wall bracing. Say "Insanitary Buildings," and listeners may think of dirty homes that just need thorough cleaning, instead of houses without a potable water supply or lacking sanitary conveniences, as the term can mean in the BA. Perhaps much of the inertia over the remedying of substandard housing



conditions arises because it is not clear that the concern is houses that are unsafe to live in because they are unhealthy.

## **Environmental Health Journal CIEH**

### **Making a difference – David England**

The much-maligned NHS has been going through a period of massive organisational and structural change. David England explains some of these changes and examines the ways in which local government, and EHOs in particular, can join with the NHS to improve the health prospects of their residents.

### **Fuel for Thought – Tracey Khanna**

Could you live without your car? Tracey Khanna looks @car free@ living within the framework of local authority transport and air pollution strategy.

### **Sustainable development: Who needs it? – Robert Halford**

Robert Halford illustrates how lasting progress on sustainable development can be achieved through professional support and developing the skills of environmental health officers.

### **A preventable death sentence – Bill Sanderson**

Each year, thousands of people die from asbestos-related illness in the UK alone-each one preventable. Bill Sanderson comments on the HSE's proposals to strengthen controls on asbestos in the workplace.

### **A dire situation – Tracey Khanna**

The UK national homeless charity Shelter has issued a stark warning that thousands of children in the UK are at risk of ill-health accident and even death as a result of poor housing conditions.

### **Good health and safety means never having to say sorry – Gerry Warren**

Report on the complex health and safety issues highlighted in a recent case settled before the High Court, concerning the replacement of a pitched roof believed to contain asbestos.

### **Saving lives – Nick Warburton**

New Health and safety Executive regulations on the management of asbestos in non-domestic premises are aimed at reducing asbestos related deaths. Nick Warburton explains how the new regulations will affect local authorities and why they need to start preparing now.

### **Canadian Association of Public Health Inspectors – Environmental Health Review**

#### **Hydrotherapy Tub Usage Infection Risk -Cleaning and Disinfecting**

**By Scott Budgell, B.Sc., CPHI(C) and Bernice Thompson, R.N., B.N., E. T.**

Hydrotherapy tubs have the potential to act as reservoirs for the spread of nosocomial infection. Of primary concern is *Pseudomonas aeruginosa*, the fourth leading cause of nosocomial infections. In order to ensure resident security, guidelines have been recommended that address the cleaning and disinfecting needs of the hydrotherapy tub.

### **From Spade to Shade: Reducing Exposure to Ultraviolet Radiation in Australia by Melissa Stoneham, Lecturer in Environmental Health, Queensland University of Technology, Brisbane, Australia.**

This research has identified that although shade creation efforts in Local Government have been present for many years, the design and placement of shade has been haphazard and poorly planned for communities.

### **An investigation of Farming Practices to Identify Potential Health Risks Associated with Vegetable Growing by Jessie Warren, CPHI(C) and Gordon Stewart, CPHI(C)**

These results illustrate the potential for health risks with farming practices.

## **Environmental Health Scotland REHIS**

### **The Scientific Assessment of Pedestrian Slipperiness: Fact or Fiction? – Dr Paul Lemon, BSc (Hons) PhD CPhys MInstP, Human Factors Group, Health and Safety Laboratory, Sheffield, Dr Steve**

**Thorpe BSc (Hons) PhD MBA Human Factors Group, Health and Safety Laboratory, Sheffield and Mr Stephen Taylor RIBA Technology Division, Health and safety Executive (HSE), Bootle.**

Recent Health and Safety Executive statistics (HSE, 2001) show that pedestrian slipping is the single most common cause of injuries in the UK workplace. Over 30% of all non-fatal major injuries and 20% of all other injuries reported each year which lead to three or more days absence from work (known as 'over-3-day injuries') are as a result of a slip, trip or fall on the same level (STFL). In the Local Authority enforced sector (which includes areas such as hotels, leisure centres and shopping malls), STFL accidents account for more than 42% of non-fatal major injuries and 23% of over-3-day injuries to employees; there are also significant numbers of reported STFL accidents involving members of the public in this sector. Evidence suggests that the overwhelming majority of STFL accidents in HSE enforced and in Local Authority enforced areas are the result of slips alone; the estimated cost of slips to UK society as a whole is now more than £1bn per annum.

**The New Public Health Agenda – A Challenge to the Local Authority Environmental Health Function – Keith McNamara, Perth and Kinross Council**

The title of the article may raise a few eyebrows, by suggesting that the public health agenda is a challenge to Environmental Health. However this is Keith McNamara's personal view on the matter and very good they are.

**Journal of Environmental Health - NEHA**

**Salmonella and other Enterobacteriaceae in Dairy-Cow Feed Ingredients: Antimicrobial resistance in Western Oregon Riam S Kidd, MS, Annette M Rossignol, Sc D, and Michael J Gamroth MAg**

Several studies have suggested an association between the use of antimicrobial agents in animal feeds and an increased risk that humans will contract resistant strains of bacteria such as Salmonella species, Escherichia coli, and other enteric isolates. The authors of this study evaluated whether animal feeds might serve as sources of antimicrobial-resistant bacteria, especially bacteria that are pathogenic to humans. From July through August 1998, samples of feed ingredients were collected from a total of 50 feed piles located on 12 dairy farms in western Oregon. From a subset of 10 piles, repeated samples were collected over time until each pile was depleted. Analysis of the samples indicated that 42.0 percent of all 50 piles and 60.0 percent of the piles from which there was repeated sampling were presumptive positive for Salmonella. Sixty-two percent of 50 Enterobacteriaceae isolates showed ampicillin resistance, and 10.0 percent displayed tetracycline resistance. Other bacteria displayed varying degrees of resistance to ampicillin, streptomycin, tetracycline, or a combination of these antimicrobials. The extent of antimicrobial-resistant Enterobacteriaceae in feed ingredients observed in this study raises significant concerns about the potential for human health risks from food-producing animals such as dairy cows.

**A Norwalk-Like Virus Outbreak on the Appalachian Trail – Lucy A Peipins PhD, Elizabeth Barrett DMD, MPH, Michele M Monti MS, Robert Hackler, Pengwei Huang MD and Xi Jiang PhD**

In May and June 1999, an outbreak of acute gastrointestinal illness occurred among long-distance hikers on the Appalachian Trail between Catawba and Troutville, Virginia. An investigation found that 45 out of 70 hikers had become ill within two days of arriving in Catawba, Virginia. Water samples were collected from a general store frequented by the hikers and from several nearby buildings and a popular all-you-can-eat restaurant. Symptoms were consistent with those caused by Norwalk-like viruses, and laboratory diagnosis detected Norwalk-like viruses in stool and serum specimens. People who consumed food items prepared at the general store were almost twice as likely to become ill as persons who did not consume those foods. Environmental sampling of water from the taps inside and outside the general store and from several surrounding establishments in Catawba found contamination by fecal coliform bacteria but not by Norwalk-like virus. Since several hikers reported illness prior to arriving at Catawba, person-to-person transmission of a highly contagious agent such as Norwalk-like virus could not be ruled out. Poor sanitation, scarce water supplies, and crowding can increase the risk of gastrointestinal illness among long-distance hikers.

**Risk Factors for Acute Myeloid Leukemia and Multiple Myeloma: A combination of GIS and case-control studies – Steven A Speer PhD, REA, REHS, Jan C Semenza PhD, MPH, Tom Kurosake MS and Hoda Anton-Culver PhD**

Risk factors for acute myeloid leukemia (AML) and multiple myeloma (MM) include exposure to toxic chemicals present in tobacco smoke, as well as to emissions from industrial operations and petroleum refinery waste dumps. The study reported here identified these risk factors among case patients and control patients in Orange County, California, from 1984 to 1993 and determined the significance of the risk factors in the study population.

A case-control study was performed for 604 cases of AML and 643 cases of MM; there were 7,122 control subjects who had colon cancer. The model included the variables smoking history, occupational history, and residence in a census tract with a petroleum refinery waste dump. A geographic information system (GIS) analysis also was performed to correlate the incidence of AML and MM with proximity to the six dump sites that received large amounts of petroleum refinery waste. Current smokers were found to be at an increased risk of AML with an odds ratio of 2.0.

Laborer/equipment cleaners and transportation workers/movers were at risk of AML with odds ratios of 3.5 and 2.4, respectively. Construction/resource extraction workers were at risk of MM with an odds ratio of 2.8. GIS analysis determined that the risk for MM was 1.6 cases per mile for 10 or more years of residence near a large chemical dump.

The authors were able to identify census tracts with a high incidence of AML and MM, and to perform distance analysis using a statistical measure of spatial randomness. The case-control study identified occupational and lifestyle risk factors for AML and MM that were not apparent from census-tract-level data.

### **Increased Prevalence of Malignant Diseases in the Close Neighbourhood of Children with Cancer – Ulf Samuelsson MD, PhD, Britt Gustafsson MD PhD, and Jonny Ludvigsson MD, PhD**

Clustering of cancer in families may be due to chance, inherited genetic mutations, common exposure to environmental agents, or a combination of these factors. The authors, to address a clinical impression that cancer occurs more often in the environment of a child with cancer, investigated whether the prevalence of cancer among children and adults in the neighborhood of children with cancer was higher than the prevalence in the neighborhood of healthy children. One hundred thirty-seven children diagnosed with a malignant disease between 1981 and 1992 at the Department of Pediatrics, University Hospital of Linköping, Sweden, were investigated and compared with 232 healthy control children. The control children were traced from the official Swedish population registry. It was found that 13 percent of the children with cancer and six percent of the control children were close neighbors of other children diagnosed with cancer ( $p < .05$ ). Cancer also was more common in the circles of acquaintances around the children with cancer than in circles of acquaintances around control children ( $p < .03$ ). The frequency of cancer in the neighborhood or in the circle of acquaintances was significantly greater in older children than in younger children. These results support the hypothesis that environmental factors can initiate or precipitate cancer in children as well as in adults.

### **Childhood Lead Poisoning Investigations: Evaluating a portable instrument for testing soil lead – Ginger Reames and Larrie L Lance PhD**

The Childhood Lead Poisoning Prevention Branch of the California Department of Health Services evaluated a portable X-ray fluorescence (XRF) instrument for use as a soil lead testing tool during environmental investigations of lead-poisoned children's homes. A Niton XRF was used to test soil at 119 sampling locations in the yards of 11 San Francisco Bay Area houses. Niton XRF readings were highly correlated with laboratory results and met the study criteria for an acceptable screening method. The data suggest that the most health-protective and time-efficient approach to testing for soil lead above regulatory levels is to take either surface readings or readings of a test cup of soil prepared by grinding with a mortar and pestle. The advantage of the test cup method is that the test cup with soil may be submitted to a laboratory for confirmatory analysis.

### **An Assessment of Lead Exposure Potential from Residential Cutoff valves – Richard P Maas PhD, Steven C Patch PhD and Andrew F W Parker PhD**

It is increasingly recognized that even very low lead exposure can result in measurable and permanent neurologic damage, especially to infants and young children. Although lead exposure from tap water continues to decline in the United States as a result of various regulatory and corrosion control measures, tap water continues to represent a significant (about 14 to 20 percent) source of total lead exposure. As of March 2002, nearly all valves used in residential plumbing systems continue to be made with 5 to 7 percent leaded brass. In this study, the authors measured the amount of lead discharged by these parts under laboratory

conditions and found that the typical resident would be exposed to small amounts of lead, particularly from gate and ball valves. Typically, water passes through three to six such valves before reaching the tap. Thus, these leaded-brass valves represent a significant, widespread, and needless source of lead exposure to the U.S. public, especially given that numerous models of no-lead valves are now commercially available.

**Outbreaks in Drinking water Systems, 1991-1998 – Gunther F Craun MPH, PE, DEE, nena Nwachuku PhD, Rebecca L Calderon MPH, PhD and Michael F Craun MS**

During 1991-1998, 126 outbreaks, 429,021 cases of illness 653 hospitalizations, and 58 deaths were reported in public and individual water systems in 41 states and three U.S. territories. bacterial, viral, or protozoan etiology was identified in 41 percent of the outbreaks, and a chemical contaminant was identified in 18 percent. No etiological agent was determined in the remaining outbreaks. Important causes of outbreaks included contamination of untreated ground-water, inadequate disinfection of groundwater, and distribution system deficiencies, especially cross-connections and corrosive water. The responsible pathogen or chemical was identified in water samples collected during 31 percent of the reported outbreaks. Coliform bacteria were detected in water samples collected during the investigation of infectious disease outbreaks in 83 percent of noncommunity and 46 percent of community water systems, but very few of these systems had exceeded the U.S. Environmental Protection Agency's maximum limit for total coliforms in the 12 months before the outbreak.

**Release of Hazardous Substances in Schools: data from the Hazardous Substances Emergency Events Surveillance System, 1993-1998 – Zahava Berkowitz MSc, Gilbert S Haugh MS, Maureen F Orr MS and Wendy E Kaye PhD**

This report describes the adverse public-health effects resulting from releases of hazardous substances in schools. Data were analyzed from emergency events reported to the Hazardous Substances Emergency Events Surveillance (HSEES) system by 14 participating states during 1993-1998. Compared with all other types of events, a higher proportion of school-related events resulted in victims (relative risk [RR] = 3.94, 95 percent confidence interval [CI] = 3.37-4.60) and in evacuation (RR = 5.76, 95 percent CI = 5.16-6.43). The most common cause of these events was operator error, followed in frequency by equipment failure, improper mixing, and deliberate releases. The majority of victims were exposed to spills emitting noxious gases, and their resulting symptoms were primarily associated with the respiratory tract.

**An Exposure Assessment of PM10 from a Major Highway Intechange: are children in nearby schools at risk.**

In urban areas, elementary schools may be in close proximity to major roadways. Major roadways have been shown to be a significant source of particulate (PM10) air pollution. In several recent studies, particulate air pollution has been demonstrated to be an important factor associated with negative respiratory health effects, especially in minority children. In response to community concerns, during April 2000 the Office of Environmental Health and Safety of the Los Angeles Unified School District conducted an exposure assessment study in the East Los Angeles area, a region populated predominantly by ethnic minorities (predominantly Hispanic). The purpose of this study was to determine if children attending some of these schools are exposed to PM10 at sufficient levels to cause negative respiratory health effects. Results of this study show that students in close proximity to major roadways receive a dose of PM10 at levels approaching 10-15 micrograms per cubic meter, an exposure predicted to cause negative health effects.