E&HI Environment & Health International

Magazine of the International Federation of Environmental Health

Volume 13: Issue 1 June 2011

ISSN 1683-3805

A word from the IFEH President

Robert Bradbury

Hello and greeting from Victoria, British Columbia, Canada where the thermometer reached 20 degrees yesterday for the very first time this spring. The past few months and related weather has shown definite signs of significant global climate change. One has to wonder if we should not shift the focus from climate change to that of **climate protection**, which in essence is what we are struggling to achieve.

The Board of Directors of the IFEH met recently in Lisbon, Portugal. This meeting coincided with the European Federation of Environmental Health meeting the following day. We were fortunate to have the European Regional Chair, Kati Gruenwald and our Journal Editor, Hadrian Bonello join us for the Board meeting. This was our first opportunity to have representation from a Regional Chair join in the meeting deliberations since the expansion of the Board to include Regional Chairs.

A key meeting issue was further discussion regarding the Competency Based Curriculum and the correspondence received from South Africa. There will be further dialogue respecting this matter at the September Council meeting. Will we ever reach endorsation of this document from member organizations? The question remains, or are we better served with a revised focus towards an internationally recognized professional profile and a shift away from the international curriculum? Respecting the International Faculty Forum (IFF), the liaison process to the IFF over the years has not borne fruit in my estimation. I believe, and I am certain many will agree, that we need the IFF to be more actively involved and better linked to the organization via a different approach within our governance framework. Your thoughts and comments on the matter are appreciated.

Draft Budget 2012 was agreed upon and will now be presented to the Council. The need to develop additional revenue streams was discussed. Changes to the Congress Hosting agreement were discussed with the caveat for a requirement for financial reports to be provided at the conclusion of the Congress. This will greatly assist us in our planning approach to World Congresses. It was also suggested we create two additional membership categories, those being retired and students. Support for the approval of these changes will be required at the upcoming AGM in September.

I was fortunate to attend the European Federation of Environmental Health meeting the following day where the group was pleased to welcome our Spanish colleagues to the regional meeting. We look forward to the ongoing involvement of our Portuguese and Spanish colleagues and have asked their

assistance in seeking access into organizations and academic institutions within the Latin America areas. The learning opportunity for me from the EFEH meeting was the more inclusive and involved our meetings and business undertakings are, the greater the ability learn and understand from each other. The European region is uniquely positioned through its regulatory approaches. Each IFEH region offers a unique geographical set of issues, concerns and similarities. It would bode well for the future of environmental health if we can better integrate these approaches through a stronger process of interconnectivity which in lies the strength and the opportunity for the Federation.

Many thanks to our Portuguese colleagues for their wonderful hospitality and the camaraderie extended to everyone and to the city of Lisbon officials for their assistance with our meeting requirements and for allowing us the privilege to use their historical facilities.

We have been working through Peter Davey our President-Elect with our Indonesian Colleagues for the hosting of the next Council meeting to be held in Bali, at the end of September. Meeting details have just been released. This is shaping up to be a wonderful event thanks to the planning activities of our hosts and we look forward to as many organizations as possible attending.

Monday, September 26th will mark the fist declaration of World Environmental Health Day and we are extremely pleased to launch this initiative in Indonesia. This event coincides with the establishment of the IFEH and I can think of no greater way to celebrate our history and organization than through the creation of a day that recognized environmental health globally. A special thank you to Les Milne for the conceptual process.

I look forward to meeting with you in Bali. Continued best wishes to all.

Robert W Bradbury, President

Contents:

www.ifeh.org

About IFEH

INTERNATIONAL FEDERATION OF ENVIRONMENTAL HEALTH

The Federation works to disseminate knowledge concerning environmental health and promote co-operation between countries where environmental health issues are trans-boundary. It promotes the interchange of people working in this sector and the exchange of Member's publications of a scientific and technical nature.

Amongst other things, the Federation seeks to provide means of exchanging information and experience on environmental health, to hold Congresses and meetings to discuss subjects relevant to environmental health science and administration, to represent the interests of environmental health to state agencies, national governments and international organisations and to promote field studies of environmental health control.

Front Cover Photo: Panoramic View of Vilnius, the city where the next IFEH World Congress will be held.

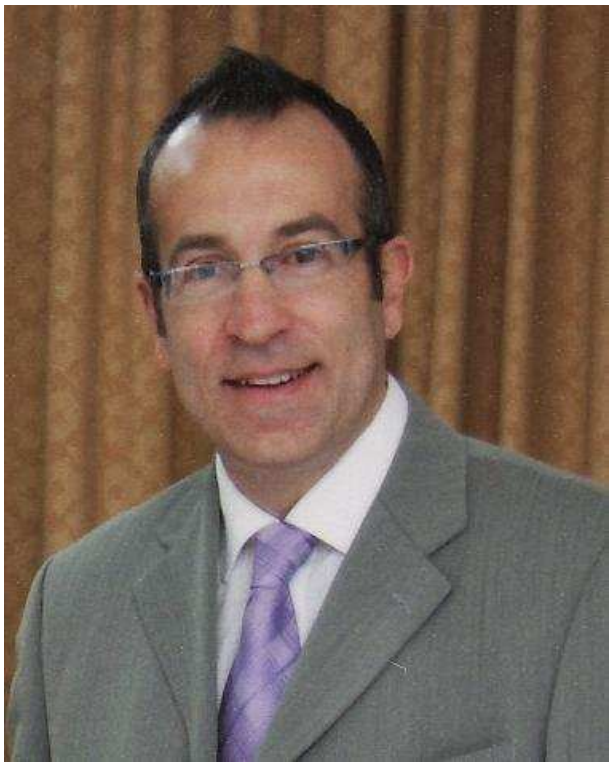
Back Cover Photo: Collage of Photos of Lithuania

www.ifeh2012.com

IFEH REGISTERED OFFICE, Chadwick Court, 15, Hatfields, London, UK SE1 8DJ

Editorial

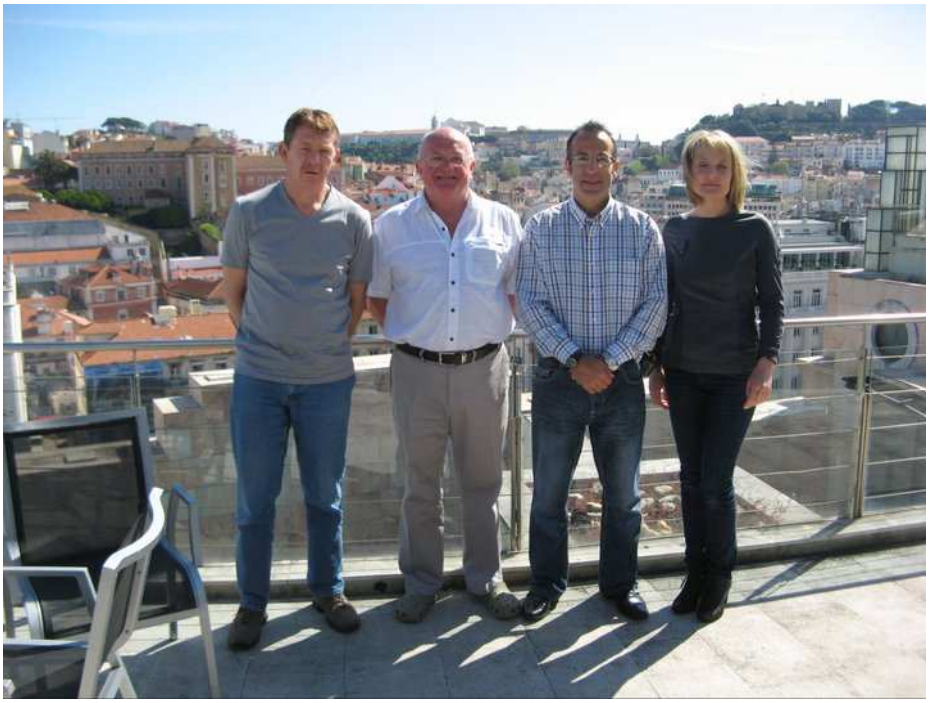
Hadrian Bonello



Did you know that the greatest environmental threat the world has is global warming?

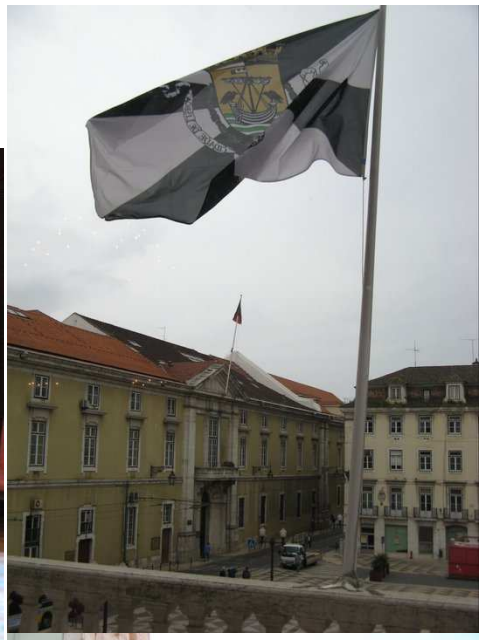
When car fuels like petrol and diesel burn for energy purposes they release water and carbon-dioxide as a by-product to the air. Even though it doesn't affect the human health directly, it causes climate changes that we witness today. These climate changes are harmful to human health. Road transport being the major source of transport especially in the urban areas, it means that cars are a profound contributor to global warming.

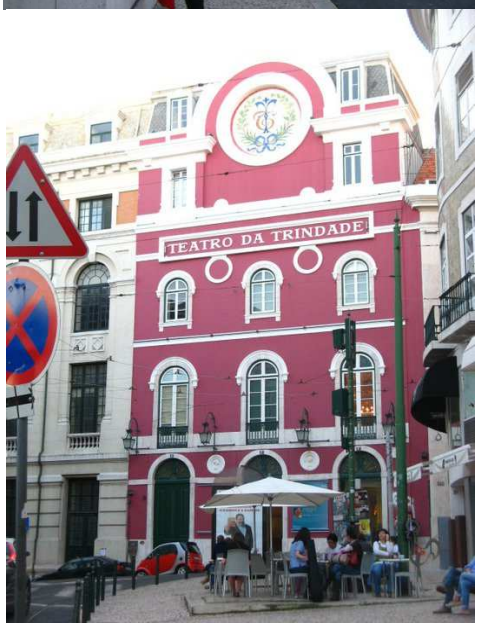
Before cars are cleared for sale it must meet the required standards of exhaust emissions. To curb this the government introduced the car tax emissions whereby a car is charged in relation to the amount of emissions it produces. This in turn has encouraged most of the drivers to buy cars that are environment friendly. This not only reduces the amount of exhaust emissions to the air and reduced tax rate to the driver but also helps in saving the environment from global warming hence a comfortable environment for human health.

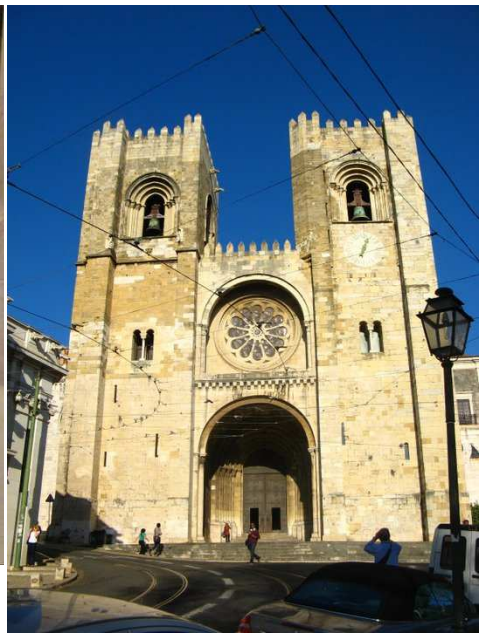


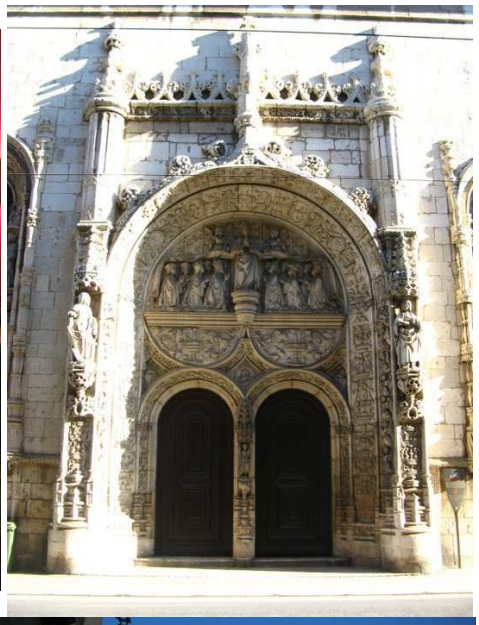
IFEH Group: Meeting in Lisbon Portugal

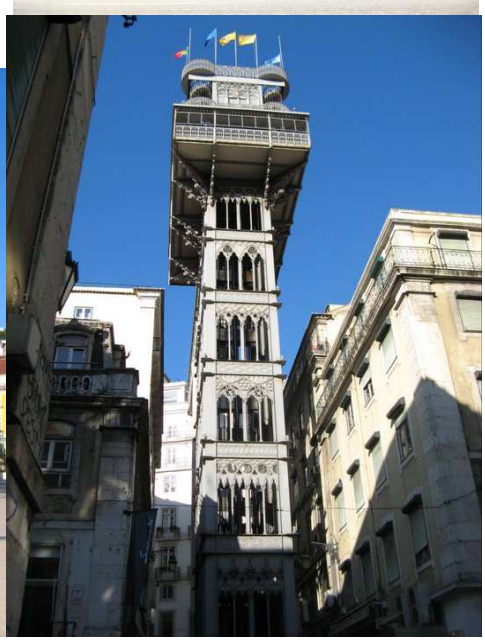
EFEH Meeting, Portugal in photos











ROY EMERSON — A TRIBUTE

Michael Halls, IFEH Past President

Roy Emerson and his wife Dorothy at the CIEH Congress in Bournemouth in 2006

Photo: Courtesy Raymond Ellard, Hon Secretary IFEH

Roy Emerson, who passed away suddenly on 27th December, was a remarkable, kind and generous man who loved life and whose passing leaves a gap in the lives of very many colleagues in all corners of the World.

Roy was the quintessential Environmental Health practitioner and what he achieved during his long and distinguished career marked him as someone special. His greatest achievements came in the field of Housing but, in all other aspects of Environmental Health, he was a person to whom others turned for help and advice. Such help and advice was always given willingly and with a genuine wish to be of assistance.

He was the person to whom the fledgling International Federation turned in 1988 to lead it into the Inaugural World Congress in Sydney, Australia and he set the standard to which every President since has aspired.

Roy, together his wife Dorothy, were regular attendees at IFEH events, particularly World Congresses, right up until 2006 and, although they were unable to be at subsequent gatherings, Roy was always anxious to learn how things had gone and what progress IFEH had made. He was particularly disappointed to be unable to make the return trip to Brisbane in 2008.

I have lost a dear friend and colleague and the international Environmental Health community has lost a loyal supporter and a dedicated champion for its aims.

The Declaration of Sydney

The International Federation of Environmental Health meeting here in Sydney, this twenty third day of September in the year nineteen hundred and eighty eight, in conjunction with the Inaugural World Congress of Environmental Health pledges its support to the Declaration of Alma Ata and for its part, calls on all governments of the world, international organisations and the world community, to make care for the environment in the interest of human health, an essential primary concern in their efforts to achieve progress and strive to rid the world population of exposure to environmental hazards which pose a threat to human health.

23 September 1988, Sydney Australia

THE INTERNATIONAL FEDERATION
OF ENVIRONMENTAL HEALTH

For further information about the Federation, contact:
Ray Ellard, Honorary Secretary
Dublin, Ireland

e-mail: secretary@ifeh.org
website: www.ifeh.org

Exploring and describing the perceived basic needs and resources for the elderly in the peri-urban and rural communities in the HHOHHO region in Swaziland

Dr. Eunice M Mabuza,

University of Swaziland

E-mail: emmabuza@uniswa.sz

Professor M Poggenpoel & Professor CPH Myburgh

University of Johannesburg

ABSTRACT

Qualitative, explorative, descriptive and contextual research designs that were utilized are described as a method chosen by the researcher in Phase One of the study the objective of which was to explore and describe the perceptions on the basic needs of the elderly and resources for meeting these needs in the peri-urban and rural communities in the Hhohho region in Swaziland. Individual in-depth face-to-face and focus group interviews as data collection methods are fully described and Tesch's steps for data analysis are described. Lincoln as are Guba's model (1985:290) to establish and maintain trustworthiness of this study is also described.

The purpose of the study was to describe a strategy that will **assist community nurses to mobilize resources for meeting the basic needs of the elderly in the peri-urban and rural communities in the Hhohho region in Swaziland. The study population consisted of the male and female persons aged 60 years old and above and key informants. Purposive sampling was utilized to select participants who met the inclusion criteria. Data were collected using focus groups and individual in-depth face-to-face interviews. Tesch method of qualitative**

data analysis was utilized to generate themes.

INTRODUCTION

The research methodology is discussed in detail. The research design was chosen so as to respond to the objectives of the research and research questions. In this paper the research design, with all its aspects that is, research purpose, objectives, research design, data gathering, population and sampling, data analysis, ethical considerations as well as trustworthiness are described to clarify how the researcher implemented the study process.

THE PURPOSE OF THIS PAPER

To share with other researchers information on how the results of a study of this nature were achieved.

RESEARCH OBJECTIVE

To describe the methodology that was used in Phase one of the study which aimed at exploring and describing the perceptions on the basic needs and the resources for the elderly in the peri-urban and rural communities in the Hhohho region in Swaziland.

RESEARCH DESIGN

Qualitative, exploratory, descriptive and contextual designs were utilized (Streubert and Carpenter 1999:17). They are described as follows:

Qualitative

Qualitative research is a way to gain insights through discovering meanings. It is a means of exploring the depth and richness, and inherent in a phenomenon (Burns and Grove 1997:67). The insight gained from these interviews, was used to explore and describe the basic needs and the resources to be mobilized in meeting the needs of the elderly in the Hhohho region in Swaziland.

Exploratory

Because of the relatively unknown field of this research, the researcher worked from a position of not knowing. This enhanced the broadness of information collected from the participants. An exploratory approach was vital for this research because very little was known about perceptions on the basic needs and resources of the elderly in Swaziland. To employ this approach, the researcher approached the project without a detailed knowledge of the subject (Burns and Grove 1993:28-9).

Descriptive

The intention of such a design is to give an in-depth clarification of a specific individual, situation, group or organization (Mouton and Marais 1994:43). The use of the descriptive design facilitated the description of the basic needs and the resources for the elderly by applying the principles of *"bracketing"* and *"intuition"* so that the phenomenon under study could unfold without hindrance (Siphepho 1999:17).

Contextual

This research study was of a contextual nature (De Vos et al 1998:281) whereby the elderly were studied as a whole within with their natural environments.

RESEARCH METHODS

Phase One to which these methods are focused, aimed at the exploration and description of the perceptions on the basic needs and the resources for meeting the needs of the elderly.

The methodology for the first phase of this research will now be discussed.

Phase One: Exploration and description of the perceptions on the basic needs and resources of the elderly in the peri-urban and rural communities in the Hhohho region

Data collection

In this phase both individual in-depth face-to-face and focus groups interviews were utilized to gather data on the basic needs of the elderly and the resources for care.

Pilot study

In this research, a pilot study consisting of one focus group and one individual in-depth face-to-face interviews were conducted to test the clarity of the questions in

the Manzini region. In this research the pilot study helped the researcher to improve the interviewing techniques (Burns and Grove 1993:48). The research assistant had an opportunity to participate and monitor the recordings of the interviews.

Population and sampling

Elderly persons both male and female, who resided in the peri-urban and rural communities in the Hhohho region, were included in the sample. The key informants were, respected and knowledgeable people in the setting under study who were crucial participants in this research for a number of reasons. They provided the researcher with a deeper understanding of the setting under study. They also assisted in identifying, tracing and persuading the participants (elderly) who were particularly important in the research (De Vos et al 1998:285).

Sample size

In this study a total of thirty one (thirty one (31) elderly participants and eight (8) key informants constituted the sample size. The size of the sample was determined by the principle of saturation (Streubert and Carpenter 1999:25). Once the participants had volunteered to participate in this research, data gathering was begun.

Selection of participants

In this research the sample consisted of the elderly members for the focus group interviews and key informants for the individual in-depth face-to-face interviews. Included in the sample were elderly persons, male and female, aged 60 years and above; and key informants included one rural health motivator, two key leaders, two social welfare officers, two members of Philani Maswati Charity Organization and one member of Umtfunti Association. The research participants in this study were selected because they had some experience concerning the everyday lives of the elderly.

The two methods to be employed in this phase of the study are discussed separately and as follows:

- *Description of how focus group interviews were conducted*
- *Data gathering was based on guidelines described by Holloway and Wheeler (1996:148). These guidelines are as follows:*
- *A top quality tape recorder with cassette in situ was used with the permission of the elderly.*
- *Ground rules were established.*
- *Time management was given priority and the interviews lasted for not more than one and a half hours.*
- *The interviews were tape recorded and later transcribed verbatim.*
- *Field notes were made directly after the interviews as a verifying measure.*

Once all participants were seated the focus group interviews were opened with introduction. The moderator explained that they had been selected because their opinions on the basic needs of the elderly and resources for meeting these needs were important. All participants were encouraged to express their points of view, experiences and feelings freely and spontaneously (Folch-Lyon and Trost 1981:447). The purpose of the research was explained to the participants. Participants were made to feel that their contributions were valued and confidential. They were informed about the use of the audiotape recorder in order to capture the discussion details accurately for transcription and data analysis. The recorder was set up prior to the interviews and was made visible to participants (Van Zyl 2001:10). The first few minutes were used for establishing a relationship between the researcher and the participants. This stage included the introduction, welcome, overview of the subject matter, ground rules, assuring confidentiality, obtaining consent to participate in the research, reminder of the duration of the session and pinning of the surname tags to help the participants to remember each others name so as to promote group cohesion (Holloway and Wheeler 1996:148). The researcher as the moderator, attempted to build rapport in the group. Steward and Shamdasani (1990:18) suggested that it is a good idea to have group members introduce themselves and tell a little about themselves. This

method can help "break the ice". The recommended pattern for introducing the group includes the welcome, overview of the topic, ground rules and the first question (Krueger 1994:80). According to Krueger (1994:75), moderators must be mentally alert and free from distraction, anxieties and pressures; should practice the discipline of others in a group situation; should memorize the questioning route and should be able to listen and think at the same time. When establishing rapport, the interviewer should project the positive image of a good person engaged in a harmless but important task. An effective interviewer should develop trust and mutual respect; speak and act in ways that are non-threatening and cultivate a neutral role. The interviewer must also be compassionate and sympathetic towards the interviewees.

Techniques for establishing and maintaining trust include being always honest; providing motivation by interviewing participants when it is best for them and not necessarily most convenient for the researcher. It is also necessary to avoid promising anything that cannot be perceived. Maintain respect and acceptance by always remaining neutral and be aware that the informants are observing and questioning the researcher too (Krueger 1994:75).

The researcher explained to participants the role of the second interviewer who was to take field notes without participating in the discussion. The participants were told that their comments were being recorded in order to capture all their ideas and thoughts (Israel 1993:4). They were told that refreshments were going to be served after the discussion as a way of appreciation for their willingness to support the efforts of the study.

The groups were scheduled for a day and time that was convenient for the participants. The group interviews were conducted in a convenient place where the participants were accessible. During the process of conducting the focus group interviews, the researcher engaged the services of the second interviewer who took field notes while the researcher facilitated the group interviews. According to Lewis (2003:3) the notes should be complete and useable in the event that the tape recorder stops working. In addition, Lewis (2003:3) suggested that regardless of the method of data collection, the moderator should make field notes after each session to facilitate data analysis. Field notes are a record of observation of researchers in the field while collecting data through interviews or observations. The field notes were descriptive, contained the time, date and place where the interviews took place, who was present, what the physical setting was like, what interactions occurred, what activities took place and any other descriptive information that would permit the researcher to recall the setting of the focus group interview. Everything that the researcher observed was data. Thus, a diary of field observation was kept. All field notes were dated and labeled (Holloway and Wheeler 1996:102-149). These field notes can be retrieved and analyzed if and when needed (Siphepho 1999:24).

For the purpose of this study three focus group sessions were conducted with the elderly who met the criteria. Israel (1993:2) also recommends this number of group sessions. The focus group interviews involved seven to eleven participants.

Preference for a larger group was based on the fact that the effectiveness of the focus group can be maximized if the size of the group can be kept between 8 and 12 people (Israel 1993:2). Most focus groups consist of between 6-12 people. However, the number of participants will depend on the objectives of the research (Steward and Shamdasani 1990:17).

The focus group interviews in this research aimed at obtaining a high quality and a wide range of data on the basic needs of the elderly and the resources for meeting these needs. The interviews were conducted as an open conversation in which each participant could ask questions from other participants and respond to comments made by others including the researcher (Folch-Lyon 1981:443). The participants were made comfortable. They were seated in a semicircle so as to have a full view of one another to encourage interaction. Name tags were issued to participants for purposes of group facilitation using surnames only. Israel (1993:4) suggests that members of the group

will need to identify themselves before they speak.

A high quality tape recorder was strategically placed to capture the process of discussion between the facilitator and the participants. Tape recorders are invaluable for focus group discussions, however they are prone to pick up background noises (Krueger 1994:17).

The following central question was put to each focus group:

"What are your perceptions about the basic needs of the elderly and resources for meeting these needs in the peri-urban and rural communities in which the elderly persons live within the Hhohho region?"

The researcher encouraged the participants to describe their views as fully as possible, that is, perceptions with regard to basic needs and the resources which the community nurses could mobilize in meeting their basic needs at the clinics, health centers and communities. During the process of interviewing the researcher encouraged all types of comments. The researcher was careful not to make conclusions about the responses and to control any non-verbal cues that might portray approval or disapproval of communications. It was explained to the participants that there were no wrong or right answers, but rather different points of view. The researcher learnt from what the participants said or felt about their basic needs and resources for meeting these needs.

The duty of the researcher was to help the participants to explain things in more detail by asking questions and probing (Streubert and Carpenter 1999:43). When more clarification was needed, more open-ended questions were asked. These questions focused on highlighting by giving other examples that the participants could add to describe the basic needs and resources for meeting those needs. The researcher also paused for further clarification of statements that were not clear to her. In pausing, the researcher helped the participants to identify and explore their basic needs and the resources for meeting their needs. Other techniques, which included open-ended questions, tracking, clarifying and provision of a reflective summary were used (De Vos et al 1998:310-311). Listening skills such as eye contact and leaning forward were also observed. There was no pressure on the group to reach a consensus. A reflective journal, in which, information was recorded about the self, the happenings and about the method of research on a daily basis was used (Holloway and Wheeler 1996:58).

Tips on managing the focus groups sessions in accordance with Israel (1993:4) were taken into account during the focus group sessions and as follows:

Allow periods of silence;

Avoid asking questions that seem to suggest a "correct" answer;

Try not to let strong personalities dominate the discussion;

Encourage input by those who are less inclined to speak out on the question being discussed;

Make every effort to practice good listening skills.

Data gathering continued until the researcher believed that saturation had been achieved (Streubert and Carpenter 1999:44). This was repeated at least three times with different participants. The focus group interviews lasted for one and half hours on average. In this study the interviews came to an end when the participants believed that they had exhausted their descriptions (Streubert and Carpenter 1999:43).

Individual interviews

The individual interviews in this research were done not only for the sake of triangulation but also for the following advantages over the focus group; there is no competitive atmosphere; there is more time for details; it is a more appropriate technique for sensitive subjects; a large amount of information is gathered in a short time and it is possible to use more stimulating material than in a focus group. A rapport was developed so as to create a sense of equality that would enable the free flow of communication between the researcher and the partici-

pant. Once a person had consented to participate in the study, the following process was employed to facilitate establishment of 'rapport' (Grbich1999:98):

The researcher did the following:

- Made a preliminary visit or phone call to explain to the person what her/his participation in the study will involve.
- Told them how much of their time will be required that is, an interview of one to two hours duration in their home or at a location of their choice, or regular interviews over a period of time.
- Clearly explained the rights of participants.
- Stressed the importance of the person's contribution.
- Clarified issues such as who is funding the research; what is it about, and who will benefit.
- Addressed any concerns raised by the person.

A time to settle down, where the nature and purpose of the study and the interviewee's rights were recalled, preceded the individual interviews. Soft drinks were offered to break the ice and also to show appreciation for participation in this research. The time was also used to explain how the researcher came to do this research.

Explaining researcher's interest in this research area or personal experience or some other relevant reason might enable the interviewee to gain some insight into the researcher's motives. They were to know whom they were talking to and were also able to know the background and purpose of this study so that they could make informed choices regarding their participation.

The following central question was put to each individual participant:

"What are your perceptions on the basic needs of the elderly and resources for meeting these needs in the peri-urban and rural communities in which the elderly persons live in the Hhohho region?"

These interviews were carried out in the participant's home or at an alternative setting of her/ his choice and took an average of two hours in length. Folch-Lyon and Trost (1981:447) also affirm "although neutrality of location is important, interviews can take place in some one's home, office, hotel or a club with meeting rooms to ensure privacy". The interviews (with permission) were tape recorded using a reliable tape recorder with good sound production. The tape recorder was checked before commencing the interviews. Spare batteries were provided for cases where there was no electricity. The interviews were transcribed at the end of each day of the interviews. Follow ups were made through phone calls or another interview. This served to verify the information, follow up emerging issues, and provided a database on which to build interviews with other key informants.

Data analysis

The researcher is intimately involved with the participants and the data that is generated (De Vos et al 1998:334; Lederman 1990:124). In order to facilitate the process of data analysis, the researcher was completely immersed in the discussions during the focus group as well as the individual interviews of the key informants by listening, observing and recording while the participants described the basic needs for the elderly and the resources for meeting these needs. The interviews were recorded and the researcher listened to each tape before making transcripts. All audiotapes and field notes were dated and labeled since they also contributed to the meaning and interpretation of the analysis. A wide margin was left on the transcript for coding and categorizing. The transcription included laughter, notes about pauses and emphasis (Nyamathi and Shuler 1990:1285). Tape-recorded interviews were transcribed verbatim. Field notes on anything unusual or interesting were included (Holloway and Wheeler 1996:149). The description method of data analysis of Tesch (in Creswell 1994:154-156) was utilized in analyzing data in this research. Tesch's method (in Creswell, 1994:154-156) of data analysis includes eight steps. These steps are described as follows:

1. Get a sense of the whole by listening to the tapes, reading through the transcriptions carefully and jotting down some ideas as they come to mind.

The researcher listened to the audiotapes several times so as to internalize the content and then the content was transcribed verbatim, carefully read through the transcriptions and jotted down ideas as they came in mind.

2. Pick one interview tape (the most interesting and shortest one) and go through it, asking yourself what it is about, and thinking of the underlying meaning. Then write thoughts in the margins.

The underlying meaning was achieved by logically selecting the tapes and listening to them thoroughly and repeatedly and also writing down the emerging thoughts in the margin.

3. When the researcher has completed the task, the researcher will make a list of topics. Cluster together similar topics. Arrange these topics in columns under major topics, unit topics and those left over.

The researcher had three focus group interviews and eight individual in-depth face-face interviews. From these interviews similar themes were clustered together.

4. The researcher will take the list and go back to the data, abbreviate the topics as codes and write the codes next to the appropriate segments of the texts. Try the preliminary organizing scheme to see whether new categories and codes emerge.

5. Find the most descriptive wording for the topics and turn them into categories. Reduce the total list of categories by grouping together topics that relate to each other. Draw lines between the categories to show interrelationships.

Steps 4 and 5 were combined and followed the preliminary organizing scheme to identify new categories and emerging codes, found the most descriptive wording for the themes and turned them into categories. Grouping themes that are alike reduced the total list of categories.

6. Make a final decision on the abbreviation for each category and alphabetize these codes.

7. Assemble the data belonging to each category in one place and perform a preliminary analysis.

Data material belonging to each category was assembled in one place and a preliminary analysis was performed.

8. If necessary, recode the existing data.

Raw data was sent to an independent coder with extensive experience in qualitative research and who understood the language to do open codes. The meeting with the independent coder was arranged to discuss the themes was found and categories. The themes, categories and subcategories were translated into English, so that other researchers, who might be interested in the research, understood them.

ETHICAL CONSIDERATIONS

The researcher had a moral obligation to strictly consider the rights of the research participants who were expected to provide this knowledge. The human rights of all participants were recognized and protected in accordance with the paper of Burns and Grove 1993:105-109 and guide Democratic Nursing Organization of South Africa 1998:3-6). The participants were approached personally. The study was explained to them, including the purpose of the study, the method of data collection, the approximate length of the interview and how confidentiality will be safeguarded. The researcher's identity, place of work and position were also disclosed. They were then asked if they would be willing to participate in the study and time and place were arranged at their convenience. Before the interview, time was allowed to become acquainted and to gain trusting relationship with the participants. Written and verbal informed consent was obtained. Permission to conduct the study was also obtained from the Ministry of Health and Social Welfare in Swaziland and the University of Johannesburg accepted the researcher to conduct the study. The following aspects were dealt with in order to meet requirements for ethical considerations.

Quality of research

The researcher and supervisors adhered to the highest possible standards when planning, implementing and reporting this research and did not attempt aspects beyond their capabilities. The researcher had the capability to attempt this research and approached it with integrity and honesty. In this research, the supervisor had the necessary knowledge and skills to maintain the highest possible standards. The study was conducted with honesty, without fraud, act of bad faith or misconduct. All the findings were reported in full, without omission of important data. Acknowledgement to all participants was given orally and in writing (Polit and Hungler 1995:33-38).

Right to informed consent

Written informed consent was obtained from all participants. The purpose, objectives, methods, duration and participation needed in the study were explained to the key leaders. In this study written consent was obtained from participants and others concerned in Phase One of the study. Permission was requested to use a tape recorder during the interviews. The benefits of the study were communicated to all participants and the results could be communicated to them on request. Participants were made aware of their right to withdraw their consent if they wished despite their initial consent to participate. The Hhohho regional health authorities would be informed of research results on request.

Right to confidentiality and anonymity

No names were used on the recorded tapes but rather numbers were used. Tape-recorded interviews were kept safe by the researcher until data transcription; analysis and coding had been done. All raw data were destroyed after compilation of the final research report if anonymity was threatened (Burns and Grove 1993:105-109). Linking of any specific information to a specific person was avoided so as to protect the anonymity of any participants.

Right to privacy

Privacy means that a person can behave and think without interference or the possibility of private behavior or thoughts being used to embarrass or demean that person later Grbich (1999:71). Searle and Pera (1992:71) did allude to the fact that it was the duty of the nursing profession to ensure that the rights of the public were protected at all times.

In Phase One of this study, during the focus group interviews, participants were free to discuss the questions, they respected one another's opinions and domination was discouraged. The interviews were conducted in a quiet environment (a chapel), free from interruptions. Sensitive issues were handled with the necessary respect to ensure privacy of the participant.

Right to termination

The researcher recognized the rights of the participants to terminate participation if they wished, despite initially consenting to participate. (Holloway and Wheeler 1996:50) also stated that participation could only be voluntary and the informant would be able to withdraw from the research, if they so wished at any time. In this research, participants were told that they were allowed to drop out of the study if they so wished and that they had a right to do so.

TRUSTWORTHINESS

The issue of trustworthiness in qualitative research is important to the practice of good science (Streubert and Carpenter 1999:61). According to Burns and Grove (1993:70) scientific rigour is valued because it is associated with the worth of research outcomes. Guba's model (Lincoln and Guba 1985:290) for trustworthiness of qualitative research was used to establish and maintain overall trustworthiness. The reason being that, this model is well developed conceptually and has been extensively used by qualitative researchers, particularly nurses and educators for a number of years (Krefting 1991:215). The following four criteria to ensure trustworthiness of this research are truth-value, applicability, consistency and neutrality. Applying the strategies of credibility ensured the truth-value, and applying strategies of transferability ensured applicability. Applying strategies of dependability ensured consistency and neutrality was ensured by applying strategies of confirmability (Lincoln and Guba 1985:290). In this research each criterion was discussed as

separate subheadings and as follows:

Criterion for truth-value:

CREDIBILITY

This criterion asks whether the researcher has established confidence in the truth of the findings for the subjects and the context in which the research was undertaken (De Vos et al 1998:33). Applying the strategy of credibility ensured truth-value. The criteria to obtain credibility include: prolonged engagement, triangulation, member checking, peer examination and structural coherence (Krefting 1991:214-215). Credibility strategies include the following: authority of researcher, interviewing process and time sampling

Criterion for applicability:

TRANSFERABLITY

To provide for transferability the researcher applied the following:

Demographic description of participants.

Rich description of findings.

Direct quotations from participants.

Other researchers were allowed to judge the level of transferability reflected in this research. Realization of the sample was described. Verbatim transcriptions of data collected and literature control were done. A purposive sample was used on voluntary participation of the participants.

Criterion of consistency:

DEPENDABILITY

Consistency as the third criterion of trustworthiness considers the consistency of the data, that is, whether the findings would be consistent if the enquiry were replicated with the same subjects or in a similar context (De Vos et al 1998:331). Consistency is defined in terms of dependability. The promoters carefully supervised every phase of this research. Principles of triangulation and peer examination were followed. The method of data analysis of Tesch (in Creswell 1994:154-156) was utilized. A consensus between the researcher and the independent coder were reached on identified themes, categories and subcategories. Triangulation and peer examination were observed.

Criterion of neutrality:

CONFIRMABILITY

Neutrality, the fourth criterion of trustworthiness, refers to the degree to which the findings are a function solely of the informants and conditions of the research and not other biases, motivations and perspectives (De Vos et al 1998:331). According to Krefting (1991:216-217) conformability is the strategy to ensure neutrality. The major techniques for establishing conformability are through the audit trail and the audit process (Lincoln and Guba 1985:319-320). In this research, panels of experts were selected to look into the whole research process. Doctoral seminars were also involved in the auditing. The Audit trail was maintained by keeping personal notes and field notes. Auditing was done throughout the research and not only at the end of the process. Issues of triangulation and reflexivity for application of trustworthiness were observed. The logic of the data, the analytic techniques, appropriateness of categories and quality of interpretations can be used to judge all these aspects of conformability.

ACKNOWLEDGEMENTS

With the completion of this research I wish to give thanks to the Almighty God who always protects me and sustains me in every challenge I happen to come across. I wish to profoundly express my sincere gratitude to my supervisors Professor Poggenpoel and Professor Myburgh for their untiring assistance, guidance and encouragement throughout this research.

REFERENCES

BURNS, N & GROVE, S K 1993: The Practice of Nursing Research. Philadelphia: Saunders.

BURNS, N & GROVE, S K 1997: The Practice of Nursing Research: Conduct, Critique and Utilization, Philadelphia: W.B Saunders.

CRESWELL, J W 1994, Research Design Quantitative and Qualitative Approaches, California: Sage Publications.

DE VOS, AS STRYDOM, H FOUCHE, CB POGGENPOEL, M & SCHRURINK, EW 1998: Research at grass root. A Primer for the caring professions Pretoria: JL Van Shark.

DEMOCRATIC NURSING ORGANIZATION OF SOUTH AFRICA (DENOSA) 1998: Position Paper, Ethical Standards for Nurse Researcher. Pretoria: DENOSA.

FOLCH-LYON, E & TROST J F 1981: Conducting Focus Group Sessions. Studies in Family Planning Volume 12 Number 12 December 1981 443-449.

GRBICH, C 1999: Qualitative Research in Health: An Introduction. London: Sage.

HOLLOWAY, J & WHEELER, S 1996: Qualitative research for nurses. Oxford Blackwell Science.

ISRAEL, GD 1993: Using Focus Group Interviews for Evaluating Extension Programmes. University of Florida: Cooperative Extension Service. Institute of Food and Agriculture Science.

KREFTING, L 1991: Rigor in Qualitative Research: The Assessment of Trustworthiness, The American Journal of Occupational Therapy, 45(3): 214-222.

KRUEGER, R A 1994: Focus Groups: A practical Guide for Applied Research. Thousand Oaks: Sage Publications.

LEDERMAN, L C 1990: Assessing Educational Effectiveness: The focus Group

Interview as a technique for data collection. Communication Education Volume 38, April 1990 pp 117-127.

LEWIS, M 2003: Focus Groups Interviews in Qualitative Research: A review of the literature. Jan Hughes: University of Sydney.

LINCOLN, YS & GUBA, EG 1985: Naturalistic Enquiry. Beverly Hills. California: Sage.

MORSE, J M 1992: Qualitative Health Research. Newbury Park: Sage.

MOUTON, J & MARAIS, HC: 1994: Basic Concepts. Pretoria: Human Sciences

Research Council (HSRC).

MOUTON, J 1996: Understanding Social Research. Pretoria: J.L Van Schaik.

NYAMATHI, A & SHULER, P 1990: Focus group interview: a technique for informed nursing practice. Advanced Nursing, 1990, 15, 1281-1288.

POLIT, D F & HUNGLER, B P 1993: Essentials of Nursing Research 5th edition. Philadelphia: Lippincott.

POLIT, D F & HUNGLER, B P 1995: Nursing Research: Principles and Methods. 4th edition. Philadelphia: Lippincott.

SEARLE, C & PERA, S 1992: PROFESSIONAL PRACTICE: A South African Nursing Perspective 2nd edition. Johannesburg: Butterworth Publishers (Pty) Ltd.

SERVICE, R 1989: Conducting Focus Group Research. The journal of College Admissions Winter, 1989 4-7.

SIPHEPHO, J S 1999: The promotion of Mental Health of adolescents in a township Swaziland. University of Johannesburg, (Unpublished Dissertation).

STEWART, D W & SHAMDASANI P N 1990: Focus Groups: Theory and Practice. London: Sage.

STREUBERT, H J & CRPENTER, D R 1999: Qualitative Research in Nursing. Advancing the Humanistic Imperative 2nd edition. Philadelphia: Lippincott.

UNIVERSITY OF JOHANNESBURG, DEPARTMENT OF NURSING SCIENCE, 2006: Paradigm: Vision, Theory for Health Promotion in Nursing, Research Model in Nursing.

Outcomes from Climate Change and Environmental Management Symposium

Dr Peter Davey PhD

CESDI, Griffith School of Environment, Brisbane

Peter is President Elect of IFEH

Email: Peter.Davey@griffith.edu.au

Introduction

Australia's leading environmental sciences university, Griffith University held a **Climate Change and Environmental Management Symposium** in Mexico City on 29th and 30th of November. The Symposium was a joint initiative of Griffith University's School of Environment in partnership with the Universidad Nacional Autónoma de México (UNAM).

Background

Through Griffith University's Centre for Excellence for Sustainable Development for Indonesia, the event was supported by the Indonesian Ministry of Environment and was a registered activity of the Academic subcommittee of the Mexican Ministry of Environment leading up to the COP 16 United Nations Climate Change Convention

(UNCCC) currently being held in Cancun. This Symposium brought together experts from around the world from many different disciplines to share their ideas on Climate Change and Environmental Management action. Academics, agencies, professional bodies and community representatives from the areas of Climate Change, Atmospheric Studies, Environmental Management, Healthy and Sustainable Cities, Environmental Engineering, Public & Environmental Health, Environmental Protection, Renewable Energy and Clean Technology, Atmospheric Studies, Life Sciences, Urban and Regional Planning, Food Security and Biotechnology were present.

The Symposium Chair Dr Peter Davey in his opening presentation stated that the main aim of this Symposium was to build a 'Partnership Platform' to enable joint capacity to identify, resource and implement evidence-based Climate Change Research and action Environmental Management and Environmental Engineering priority projects.

The Symposium attracted researchers from around the world including Denmark, India, Colombia, Australia, Indonesia, USA and throughout Mexico. The International Federation of Environmental Health (IFEH) was a major sponsor of the Symposium and presentations were delivered by their representatives Mr Henning Hansen and Mr Steen Fodge from the Denmark Environmental Health Association.

Mr Henning Hansen a key note speaker identified a set of sustainability indicators developed by IFEH for application in the monitoring and mitigation of climate change risks and Mr Steen Fodge outlined the methods to reduce levels of carbon in local government communities in Europe.

The Symposium supported further development of a Global Environmental Network (GEN) of universities and agencies to identify, support and implement evidence-based climate change and environmental management projects and improve research outcomes for government and non-government agencies with local communities. A key outcome was to give communities a voice and to provide environmental and climate change policy makers with the enhanced training to develop interventions.

Outcomes from Symposium

The Symposium delegates agreed on the following general principles:

Together...Create Opportunities for Climate Change and Environmental Management Research and Applied Projects

Support the principle of developed countries assisting developing countries in terms of equity

Build capacity of government agencies, NGOs and universities to work with communities to implement local solutions.

Improve the funding mechanisms for research and projects for developing countries

Continue to support the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) scheme and foster the support for this BALI-Road Map outcome at the COP 16 in Cancun.

Develop sustainability indicators for cities and communities to benchmark the impact of policy implementation

Support the collection of data to benchmark sea-level rises to address decision making for communities in low lying coastal areas.

Engage in environmental education with community groups, schools and non-government agencies via communication and social media

The delegates supported...the proposal for universities and agencies to join the Global Environment Network (GEN) to promote the development of scientific and methodological bases to integrate the efforts of teaching and research to engage advanced scientific and technological approaches.

Decision makers need to act now...

Historical data on climate, risk, potential impacts, vulnerability and coping capacities

to climate variability and change needs to be taken into account for all decision making. Good quality information is required to inform the decision makers about changes and impacts that are already occurring and the location of population groups and environmental systems that are affected. This requires continuing and advanced assessment of existing and possible climate change adaptations. Decision makers need to compare and prioritize adaptation and mitigation responses. The delegates noted that there are limits, costs and barriers for adaptation and mitigation. We need

to create adaptation policy frameworks and focus on participatory methods.

Action Plans to reduce the emission of greenhouse gases…

The delegates supported the development of plans to cut carbon emissions and increase the level of renewable energy through smart energy management.

Move to Green cities and communities…

The delegates agreed to continue applied research and projects in these priority areas:

Strategic planning for sustainability

Managing urbanisation

Energy efficient public transport

Sustainable and ecological urban water systems

Reducing urban footprints

Protecting all biodiversity

Transition to sustainable renewable clean energy

Use of Eco-technology for Improved Water and Waste Management systems in response to climate change…

Create ecologically sustainable systems such as wetlands to manage stormwater and waste water

Capture methane for energy use

Use ecological solutions to secure landfills that have reached their capacity

Food Security and Biodiversity identified as major concerns…

The delegates agreed the big challenge is to change the production model for food to one that is more environmentally friendly and energy efficient.

Support citizens and communities to develop sustainable family-run food crops.

Recognise the importance of biodiversity and support all efforts to maintain and improve current systems against future and current threats

Clean Technology Research…

Future energy systems will have to use clean technologies in order to be sustainable.

Further R&D is needed in this area with more generous subsidies available to carry out this research and support the industry.

Renewable Energies must be fostered in Mexico through subsidies, more research (Renewable Energy Institute), governmental energy policy (RE Ministry) and local industry development (Solar Thermal Concentrators)

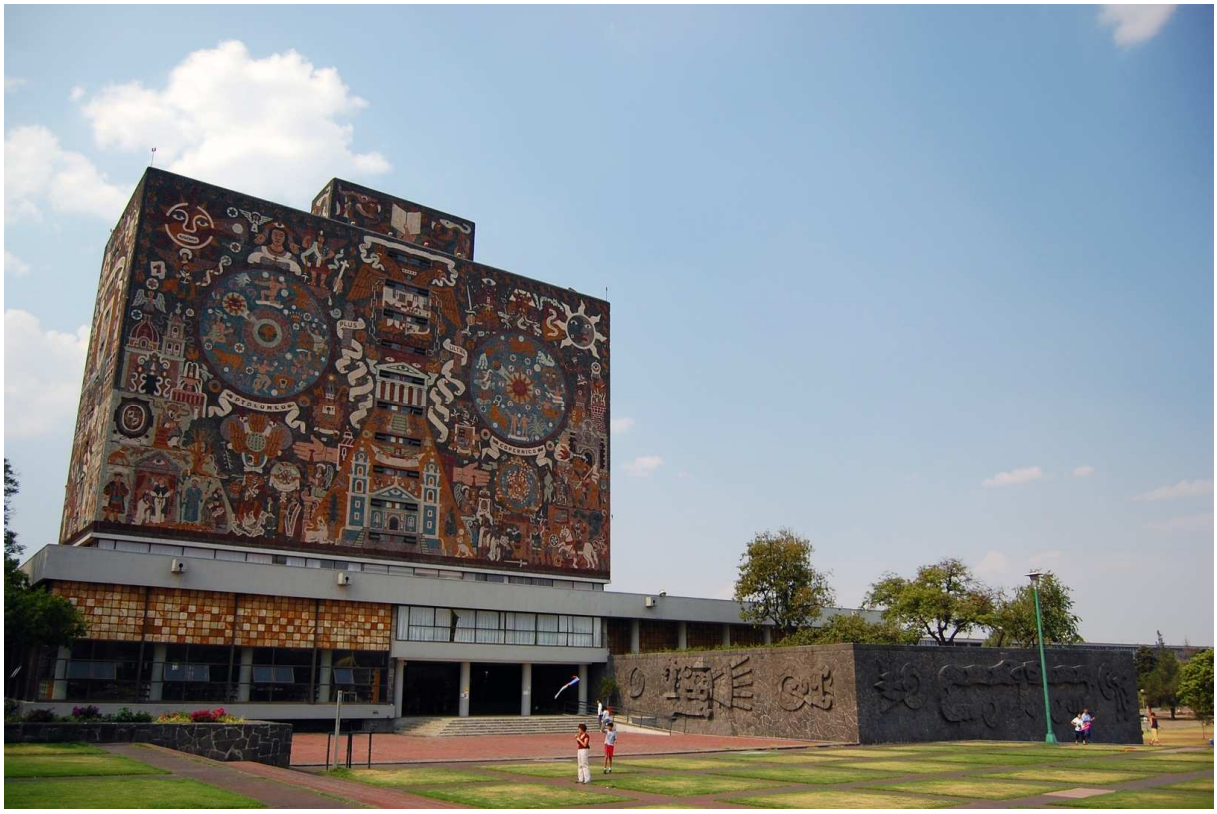
Develop the use of solar powered cars and boats and other community applications

Summary

The Outcomes of the Symposium were delivered to the Australian Embassy, the Mexican and Indonesian climate change and environmental management representatives and the Universidad Nacional Autónoma de México (UNAM) in the lead up to the UNCCC Cop 16 in Cancun Mexico. We encourage other agencies like the IFEH to distribute these outcomes to member countries for action.

Right Top Photo: Griffith Univeristy Zero Energy Building

Right Bottom Photo: Biblioteca, Universidad Nacional Autónoma de México

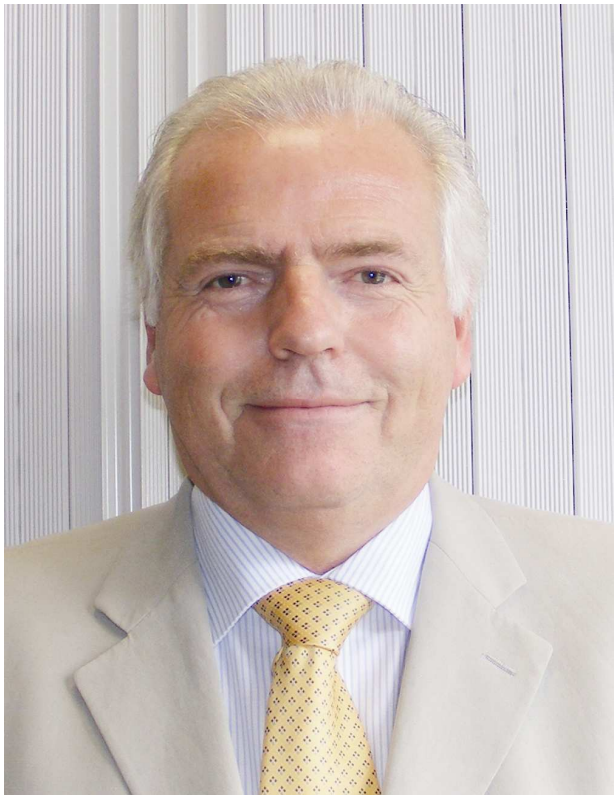


Legionella in Scotland
A hidden danger

Roderick D House FRSPH, Ch.EHO, FREHIS

Lead Consultant in Environmental Health, Health Protection Scotland

E mail r.house@nhs.net



1.0 Background

1.1 The organism was first identified in 1976 following a convention for military veteran legionnaires held in Philadelphia, USA. The outbreak involved 189 cases and 29 deaths. Investigations into the outbreak led to the discovery of the bacteria responsible which was named Legionella pneumophila as a tribute to the men affected.

1.2 The first known outbreak in Europe was in fact 1973 and was identified as pneumonia of unknown aetiology and concerned 89 tourists returning from holiday in the Rio Park Hotel Benidorm Spain, 3 of which died. The outbreak was later shown to be Legionella and was identified through retrospective investigation following the 1976 USA outbreak but not before at least 150 British tourists acquired Legionnaires disease between then and 1980. The source was finally traced to the hotel's potable water supply as it did not have an air conditioning system or cooling towers. Chlorination of the supply while maintaining water temperatures at 50-600C was sufficient to prevent further incidents.

1.3 Legionella was not a new disease but first recognised in 1976. It is now known to have caused epidemic pneumonia at least 30 years prior to the Philadelphia outbreak.

2.0 Epidemiology of Legionella

2.1 Following the 1976 outbreak national surveillance systems were established and in recent years improved detection, ascertainment, and clinical diagnosis have contributed to the increase in reported cases in Scotland, the UK, Europe and world wide. Environmental studies continue to identify novel sources of infection.

2.2 In Europe from 1996 – 2006 the incidence of Legionella rose significantly with over 600 outbreaks being reported to the European Working Group on Legionella Incidents body (EWGLI) which became the European Legionnaires' Disease Surveillance Network and was established in 2007.

2.3 The largest of these European outbreaks occurred in Murcia, Spain in 2001 when more than 800 suspected cases were reported with 449 cases being confirmed. This has been, to date, the world's largest outbreak and reported a mortality rate of 1% which in general is low for outbreaks. The subsequent environmental investiga-

tion implicated cooling towers at a hospital in the north of the city and as result of this outbreak the Spanish Government reviewed their legislation and controls.

2.4 The incidence of Legionella in Scotland is low, usually around 30 to 40 cases per year, the majority of which are contracted overseas. Thirty-two cases of human Legionellosis were reported by the Scottish Legionella Reference Laboratories to Health Protection Scotland (HPS) in 2004, 33 in 2005, 42 in 2006 and 43 2007. This is an increase when compared to the 20, 36 and 29 cases reported in 2001, 2002 and 2003 respectively. Current annual total cases of Legionellosis in Scotland are shown on the HPS website.

http://www.hps.scot.nhs.uk/Search/default.aspx?search=Legionella.

The website shows the annual total cases of Legionellosis reported to HPS from 1995-2007. The annual incidence rate in Scotland was 6.3 cases per million population reported in 2004, 6.4 in 2005 and 8.2 in 2006. The incidence is rising but figures remain relatively low when compared to the rest of Europe.

2.5 The mean Legionella incidence rate for Europe was 11.1 per million population in 2007, 11.2 in 2006, 10.3 in 2005 and 8.3 in 2004. Therefore the rise in Legionellosis in Scotland is similar to the rise seen across the rest of Europe.

2.6 The 2004-2006 three-year mean shows 67.5% (73) cases occurred in males and 32.5% (34) in females which is comparable to the three-year mean of 2001-2003 where 65.1% of cases were male and 34.9% females. The male to female ratio of cases from 1995 to 2007 reflects the historical predominance of male cases over female cases, and it is apparent for most of the age ranges and especially for those aged under 50 years(all ages 68.2% males, under 50 years rises to 82.6% males from 2004-2006.

2.7 In Europe there is a similar profile with 83% of cases occurring in over 45 year olds and the sex ratio is 3:1 against the male population.

Disease Description and Transmission

3.1 The organism is an opportunistic human pathogen, is aquatic and aerobic. There are at least 50 species with each species having subgroups called serogroups and the serogroups have further serotypes. For example Legionella pneumophila has 16 serogroups and L pneumophila serogroup1 is responsible more than 70% of cases of Legionnaires' disease.

3.2 The disease is usually diagnosed by a combination of tests. Diagnosis is currently from growing by culture from the patient's sputum, bronchial washings or lung tissue. Alternatively, tests are used to measure the presence of antibodies in the blood and specific antigens in the urine using urinary antigen detection. Urinary antigen testing is a valuable tool when investigating community acquired infections especially when the causative agent is L. pneumophila. However this is not appropriate where the infective agent is L Longbeachae as it cannot be identified using urinary antigen detection.

3.3 Legionnaires' disease is normally contracted by inhaling Legionella bacteria, either in tiny droplets of water, aerosols, or in droplet nuclei (the particles left after the water has evaporated) contaminated with Legionella, deep into the lungs. There is evidence that the disease may also be contracted by inhaling Legionella bacteria following ingestion of contaminated water by susceptible individuals. Person-to-person spread of the disease has not been documented.

It can also occur from inhaling dust particles after the water has evaporated.

3.4 The pathogenicity of the disease depends on several factors and is thought to include:

- Number of bacteria entering the body.
- Resistance of the individual.
- Susceptible groups include:
- Immunocompromised.
- Diabetics.

- Smokers.
- Over 50s especially males.
- Heavy drinkers.

3.5 The incubation period is 2-10 days and typically 3-6 days but there have been instances where the incubation period has extended to up to 14 days. In most cases there is an abrupt onset of symptoms and speed of treatment is essential to controlling the disease and recovery of the patient. The attack rate is usually around 1% but it is thought to go as high as 5%.

3.6 Symptoms may vary but generally include:

- High fever and chills.
- Headache.
- Non-productive dry cough and sometimes expectoration which is blood stained.
- Diarrhoea in 50% of cases.
- Vomiting and nausea in 10-30% of cases.
- Confusion, delirium and other central nervous manifestations in 50% of cases.

There is approximately 12% mortality in cases but this can be considerably higher if left untreated.

4.0 Legionella Ecology

4.1 Legionella bacteria are widespread in natural water and aquatic environments including:

- Rivers.
- Lochs.
- Reservoirs.
- Streams.

But also found in:

- Mud.
- Soil.
- Compost.

They are usually in low numbers but Legionella bacteria can survive under a wide variety of environmental conditions and have been found in water at temperatures between 6°C and 60°C.

Water temperatures in the range 20°C to 45°C seem to favour growth. The organisms do not appear to multiply below 20°C and will not survive above 60°C.

They may, however remain dormant in cool water and multiply only when water temperatures reach a suitable level. Temperatures may also influence virulence; Legionella bacteria held at 37°C have greater virulence than the same Legionella bacteria kept at a temperature below 25°C.

4.2 Legionella bacteria also require a supply of nutrients to multiply. Sources can include, for example, commonly encountered organisms within the water system itself such as algae, amoebae and other bacteria.

4.3 Legionella bacteria are also found in artificial hot and cold water re-circulating water systems and others systems such as cooling towers etc all of which use stored water.

The presence of sediment, sludge, scale and other material within the system, together with biofilms, play an important role in harbouring and providing favourable conditions in which the Legionella bacteria may grow.

Biofilms, sludge and scale can protect Legionella bacteria from temperatures and concentrations of biocide that would otherwise kill or inhibit these organisms if they were freely suspended in the water.

To reduce the possibility of creating conditions in which the risk from exposure to Legionella bacteria is increased, it is important to control the risk by introducing measures which:

- do not allow proliferation of the organisms in the water system.

and

- reduce, so far as is reasonably practicable, exposure to water droplets and

aerosol.

5.0 Seasonality

5.1 Incidents and outbreaks will occur all the year round in Scotland however there is in general a pattern as with other northern hemisphere countries of cases rising in the spring and peaking over the late summer. Many cases are imported resulting from infection occurring while abroad on holiday while others are a result from the increase in ambient temperatures during the summer period. During this time there is obviously an increased exposure to possible sources such as warm water showers, air conditioning, water features etc.

5.2 Again there a similar seasonal distribution in Europe as demonstrated in the European Centre for Disease Control (ECDC) Report for recorded cases during 2007.

6.0 Significant Outbreaks

6.1 While imported infection account for almost 50% of all cases in Scotland community outbreaks can be significant both in numbers and their consequence to those affected. The following community outbreaks within the UK and Europe are significant because of each of their circumstances around cause and consequence.

1985 - Stafford and District Hospital – 68 cases with 22 deaths. Similar to the Murcia outbreak in that the source was the hospital air conditioning system and those affected were outpatients attending the hospital.

1988 – BBC Headquarters - 70 cases and 3 deaths. Resulted from a poorly maintained cooling towers and affected BBC staff, members of the public walking in the area and patients in a nearby hospital where windows were open during the exposure period. The BBC was successfully prosecuted by the Health & Safety Executive (HSE).

1999 – Bovenkarspel, The Netherlands – 188 cases and 21 deaths. Resulted from a spa pool at a flower agricultural show where the water was not changed during the 9 days of the show. The cases occurred in people who had spent time at or near the spa pool.

2001 – Murcia Spain – 800 suspected cases (449 confirmed) and 6 deaths. The world's largest outbreak arising from cooling towers at a local hospital in the north of the city. National legislation to control and prevent further incidents was enacted immediately following the outbreak.

2002 – Barrow-in-Furness – 200 cases and 7 deaths. This is the largest UK Outbreak to date. Again the source was a cooling tower dispersing into a narrow walkway which was used to access the main shopping area. HSE successfully prosecuted the local authority who had control of the cooling tower.

2003/4 – Pas de Calais – 86 cases and 18 deaths. – The interesting feature of this outbreak was the long distance aerosol spread which was as far as 6km from the source. National legislation was introduced following the outbreak and findings from its occurrence now influence community investigations in relation to the distance of potential sources.

7.0 Recent Outbreaks in Scotland

7.1 Over the past 6/7 years, in addition to single cases and the usual number of imported cases, there have been notable outbreaks in the following areas of Scotland:

- Fife.
- Aberdeenshire.
- Highland.
- South Lanarkshire.
- Perth & Kinross.
- Tayside.
- South Lanarkshire.
- Argyll.
- Renfrewshire.

Five of these outbreaks have been associated with hotels and leisure facilities, 1 related to a naval dockyard, 1 to a food production factory and three related to potting compost which is associated with L. Long-

beachae.

7.2 All the outbreaks related to water systems have been found to involve a breakdown in either the documented system of work or non compliance with the HSE Approved Code of Practice L8 – The Control of Legionella Bacteria in Water Systems (ACoP L8), in that no management system was found to be in place. Interestingly during these outbreak investigations of other suspected sources of infection which were eventually excluded from the investigation also highlighted a worrying level of non compliance with ACoP L8 and also in many cases complete ignorance of its existence and relevance to the business involved.

7.3 The more recent cases related to L Longbeachae are interesting in that Scotland is experiencing these incidents while the other UK countries of England Wales and Northern Ireland have not. All 3 cases were linked to potting compost and occurred in greenhouses used by the case. Two possible reasons for lack of detection maybe, the difficulty in isolating Longbeachae from soil/compost samples and urinary antigen test failing to detect Longbeachae.

While the numbers are relatively small compared to the number of bags of compost sold annually, discussion with the trade associations have commenced on the proposal to introduce warning labels on the packaging. In the absence of labelling the current advice includes handling the compost with care, damp down with water to reduce dust before handling, use a face mask covering nose and mouth to reduce the risk of inhaling the dust and washing immediately after handling compost and before eating drinking or smoking. This advice especially important for those individuals at high risk from infection.

Hopefully in the future we will be following the lead from our Australasian colleagues.

8.0 Outbreak Management – General

8.1 The relevant Scottish legislation and guidelines currently relating to the establishment of an Outbreak Control Team (OCT) and the management/control of an Incident or Outbreak are:

- Public Health etc (Scotland) Act 2008, Part 3 – Public health Investigations.
- Environmental Protection Act 1990 – Nuisance Provisions.
- The Scottish Executive Guidance on Public Health Incidents (currently under review).
- Health & Safety at Work etc Act 1974.
- HSE Approved Code of Practice L8 on Control of Legionella Bacteria in Water Systems.
- HPN/HPS Guideline on Management of Legionella Incidents, Outbreaks & Clusters in The Community.

8.2 There are key elements which are generic to all outbreak investigations. The Health Protection Network (HPN) Guideline offers a template for such investigations therefore I will refer to this during the next few moments.

8.3 While the epidemiological aspects of the investigation together with the microbiological examination of human isolates is principally the domain of our public health professionals, the investigation of environmental parameters including possible sources and the consequential sampling rest with Environmental Health Officers (EHOs) and where relevant to specific premises to HSE colleagues.

8.4 The infrequent occurrence of incidents and outbreaks raises the issue of knowledge and experience of EHOs faced with an investigation. The HPN Guideline recognises this issue and as a consequence the HSE have agreed to support all outbreak control teams from the onset irrespective of whether the suspected premises are wholly local authority controlled. The Outbreak Control Team now has access to HSE specialised advice from the onset of the investigation.

9.0 Outbreak Management – Environmental investigation

9.1 Each incident or outbreak has its own

characteristics but consideration of identified potential sources is the starting point, initially looking at the higher risk sources before considering the medium and lower risk premises as outlined below.

High-risk sources

- Cooling towers/evaporative condensers/air conditioning systems – associated with major environmental/ community outbreaks.
- Hot and cold water systems (particularly in hospitals, hotels – often related to showerheads –, leisure facilities and care homes to a lesser extent).
- Whirlpools/spa baths (both "display" and leisure)

Interestingly most of Scotland's incidents and outbreaks over the past 7 years have been related to Hot & Cold water supplies and whirlpool/spa baths. The others being linked to garden compost.

Medium-risk sources

- High pressure hosing/cleaning.
- Car wash.
- Industrial water systems (engineering machine coolants, "closed" water system in plastics).
- Fountains.

Low-risk sources

- Sewage plants.
- Ship water pump repair.
- Gardening potting soil (specific Legionella species: L. Longbeachae).
- Garden sprinkling water systems (both from indoor and outdoor taps).
- "Respiratory therapy devices" which generate aerosols (health care related); "Aerosolising" devices.
- Contaminated hospital equipment.
- Hot spring bath water.
- Public bath water.
- Ice machines.
- Dental equipment.
- Food display humidifiers.

9.2 Once premises have been linked to an incident they are investigated in order of risk and the officer focuses on management and control systems together with an appropriate sampling strategy.

9.3 We are asked regularly to comment of the risk to officers sampling for Legionella in water supplies; however while, in Scotland, sampling is the responsibility of the Environmental Health Officer, the local authority as an employer must assess the risk to their employee and take appropriate action. This action may vary from providing periodic training, suitable protective equipment etc or out-sourcing the sampling undertaking through a private contractor. It must also be remembered that the risk arises when aerosols are generated therefore if this is minimised the consequential risk is also minimised.

The Environment Agency Guide:

The Determination of Legionella Bacteria in Waters and Other Environmental samples (2005) - Part 1 - Rationale of surveying and sampling.

This guide offers practical advice on sampling for investigating officers including:

- Surveying the water system under investigation.
- Risk Assessment of the water system and its ability to generate aerosols containing Legionella.
- Selection of sampling location and sampling points.
- Timing of sampling.
- Water temperature measurement.
- Sampling equipment.
- Safety of sampling officers.
- Method of sampling water and biofilms.

10.0 Outbreak Management – Premises

10.1 Any control measures identified as part of the management of an incident or outbreak must eliminate the source of exposure and may include stopping a particular process or system and where this cannot be achieved in isolation may also result in the closure of the premises.

10.2 All putative sources of Legionella within the outbreak zone should be visited. These visits should be prioritised based on local knowledge, patterns of suspected cases and individual risk associated with premises as outlined previously.

10.3 Following identification of "at risk premises" as potential sources of exposure, Environmental Health Officers should initially focus on audit of management systems and written schemes for prevention and control of water systems etc together with the application and compliance with ACoP L8.

10.4 As part of the introduction of the HPS Guideline the HSE have agreed to support EHOs in the inspection and assessment of local authority controlled premises with specialist support to the OCT. This is particularly welcome as EHOs may only be faced with an investigation once every 10 years or so and will therefore not necessarily have the specialist knowledge to critically examine and assess either air conditioning or hot & cold water systems.

11.0 Outbreak Management – Controls

11.1 Most incidents and Outbreaks over the past 7 years in Scotland which were not imported have related in some way to hot & cold water systems and the failure of the occupier to apply the relevant controls and treatments.

While more detail can be found in the publications previously mentioned in this presentation the following are generally applicable in most situations:

Thermal Disinfection: High temperature and/or flush – The temperature of the water leaving the calorifier should be sufficient to maintain > 60°C throughout the system for at least an hour. Each tap must be run sequentially for at least 5 minutes and the temperature measured (ACoP L8). Problems include risk of scalding, inability to flush whole system at once (dead legs).

Biocide Treatment: Chemical disinfection using oxidising biocides (such as chlorine or bromine solutions) or non-oxidising biocides (NOTE: chorine gas should NOT be used). Problems include limited residence time in solution, taste, local water quality regulations and accelerated system corrosion.

Ozone Treatment: Problems include expense, potentially hazardous, short duration effect and limited range within a system.

UV Treatment at Source or at Outlet: Problems include cost; can become ineffective due to fouling and have no impact on biofilms within system.

Copper/Silver Ionisation Units: Problems include cost; can become ineffective due to fouling and strict local limits on water quality.

Physical Replacement or Cleaning: Outlet points (taps, aerator units and shower heads); regular use of all outlets and the elimination of dead legs within the system.

Outlet Microbial Filtration Units: however this leaves contamination within system untreated unless used in conjunction with one of the above systems.

11.3 Legionella cannot be wholly eradicated from water systems and continued control can only be achieved by repeated (or continuous) treatment/management of the system. The effectiveness of these controls can only be assured by adhering to agreed control threshold levels set out in ACoP L8.

Current UK standards set out in table 4 of the ACoP L8 are to maintain a level of <1000 CFU/L at all times and to aim for a stable control threshold of <100 CFU/L. This is the desired control methodology.

11.4 All of the above options can eradicate

Legionella in the in vitro state (in laboratory suspension) either by continuous dosing or by a shock treatment. However none of the methods can permanently eradicate Legionella from a complete system. One reason for this is that Legionella can survive the treatment methods by sheltering inside the scale and biofilm layers which build up inside the pipe work of a system.

Another explanation is that Legionella can survive (and indeed multiply) inside certain species of host amoebae, some of which are very resistant to high temperatures and/or harsh environmental conditions.

11.5 Water produced by a system following a treatment can therefore initially test negative for Legionella but the contamination will return rapidly following re-colonisation from these "reservoirs". Some research papers state that the concentration of Legionella in the water supplies increases more rapidly and exceeds the pre-existing levels following a treatment. The reason given is that most of the microbes, which would normally compete with Legionella, have been removed from the system. There is also evidence that the proportions of certain strains of Legionella increase following a treatment as they are more resistant, (or have a greater affinity with potential treatment resistant host organisms), than other strains.

11.6 Once the management of the water system has complied with the standards set out in ACoP L8, consideration can then be given to re-starting the process or system considered a putative source of Legionella. If there is sufficient confidence in the management controls being applied to the system, consideration could be given to opening the premises based on colony counts within the water with the proviso that regular monitoring must be carried out to confirm the standards set out in ACoP L8.Therefore the eradication of Legionella from a system is not possible and control of contamination (as set out above) within the water contained in the system, is the only realistic option.

12.0 Conclusion

12.1 Throughout this short overview of Legionella and its incidence in Scotland I have tried to demonstrate that while the incidence is infrequent the results can be dramatic and in most cases wholly avoidable.

12.2 Over the past 7 years based on my involvement in a variety if incident and outbreak investigations I found the following:

50% of all incidents were imported i.e. from cases returning to Scotland after foreign travel.

Of those cases occurring in Scotland >90% were related to hot & cold water supplies.

The majority of sources of exposure were commercial premises and in each instance there was a clear failure in compliance with ACoP L8.

During these investigations, premises visited as part of the wider investigation but excluded as a potential source of exposure also demonstrated a high incidence of non compliance with ACoP L8.

Even where premises had been recently visited and inspected by EHOs there was also a distinct lack of compliance suggesting that this aspect of occupational health and safety was being in some cases overlooked at the time of inspection.

Over the past 2 years the incidence of compost related cases has become an issue of increased concern in Scotland and could be going undetected in the rest of the UK and Europe.

While this paper has been a personal overview and opinion I would like to make reference to the:

HSE Approved Code of Practice L8 on Control of Legionella Bacteria in Water Systems.

HPN/HPS Guideline on Management of Legionella Incidents, Outbreaks & Clusters in the Community.

The European Centre for Disease Prevention & Control Annual Epidemiological Report on Communicable Disease 2009,

13 -15 November 1991, Cologne

Networking, Technology Centres and Environmental Health: Towards a Science of the Heart

European Conference on Cooperation in Environmental Technology

Fred O'Brien B.A. (Phil), M.B.A., D.H.I., C.P.H.I.(C)

International Federation of Environmental Health

In its preparation for the United Nations Conference on Environment and Development, to be held in Brazil in 1992, the General Assembly of the U.N. informed the world community that it was "deeply concerned by the continuing deterioration of the state of the environment and the serious degradation of the global life support systems, as well as by trends that, if allowed to continue, could disrupt the global ecological balance, jeopardize the life sustaining qualities of the earth and lead to an ecological catastrophe".

Dr Wilfried Kreisel, Director of the Division of Environmental Health of the World Health Organization, in 1990 advised the international community that: "In every country on this planet man made environmental problems are being generated faster than we can solve or prevent those problems. In every country, environmental health capacity is inadequate to meet human needs. And when we look forward to this new decade, we know that the problems will be changing, only to become more complex, more critical, more urgent".

Our environment, on a global scale, has become less manageable because of fundamental weaknesses in the strategies selected and by the conditionings and pressures exerted on men and women by dominating structures and mechanisms in the various spheres of society. The roots of the global environmental crisis can be traced to the emergence of a scientific and administrative approach largely insufficient for the analysis, programming and management of the environment. Science and technology must be directed towards the good of humanity and, accordingly, be governed by ethical and moral principles. The need for a philosophy and activity of technology transfer that can promote the development of a correct environmental perception and form the basis of a balanced behaviour in the pursuit of environmental health objectives is urgently needed today. Technology Centres present tremendous opportunities for a form of networking that can help redress the very significant threats to the global environment by tapping the deep resources and broad range of expertise and experience of those men and women connected with such centres.

Networking Patterned on the Environment

"Now God has built the human form into the world structure, indeed even into the cosmos, just as an artist would use a particular pattern in her work." Hildegard of Bingen

Over the period 31 October to 2 November 1990, Aontas, the National Association of Adult Education of Ireland, held a workshop at the Lakeside Hotel, Killaloe. Some 45 people from different backgrounds, principally in the fields of adult education and environmental science, came together and outlined and discussed their approaches to developing a course in adult education on "Caring for the Environment". As an outcome of the gathering a core network was established and a twenty week long course on "The World In Which We Live" was subsequently offered in a number of different centres around the country.

At the Killaloe workshop before very long it became apparent that the great variety of perspectives and attitudes present could result in much disagreement. Some felt that philosophy and ethics had no place in a proposed course while others considered them as essential ingredients. Some dismissed theology as irrelevant while others considered it as important in fostering a true guardianship of the earth. The great variety of viewpoints also included those who saw human development as fundamental to any approach while others considered environmental management approaches as too anthropocentric. The depth of feeling on these issues had the potential to create a significant barrier to communication and cooperation. In addition to the foregoing differences of opinion on what has been termed "soft science" there was a variety of scientific disciplines present with different concerns, approaches and priorities.

At an early stage it appeared to me that the differences in approach presented insurmountable obstacles. But I was wrong. On the afternoon of the second day we were taken on a guided tour of North Clare and visited the area known as the Burren, a unique environment where Alpine and Mediterranean plants and other life forms thrive. As we walked the road and the land of the area the backgrounds of the different participants came into play in interpreting the environment that we were observing. Agriculturalists, botanists, geologists, ecologists, those familiar with the local history and culture and others completed a picture of what we were looking at.

Finally I found myself with a small group looking down on a patchwork of ground about the size of a tabletop. It contained perhaps a hundred or more types of plants with all variety of beautiful flowers and within these a mix of living creatures, including insects, spiders and worms.

Having experienced this patch of the environment in terms of its great diversity and overall unity, in which interconnections, interrelationships and interdependencies revealed the importance of each element and the significance of the overall pattern, I was struck by the fact that a group of

people could form a network, the model of which was the environment itself. Each member of this diverse group had an important contribution to make and our networking was of a pattern of nature.

The environment itself is a unifying force and the environmental crisis is an opportunity, particularly in the field of technology transfer, to establish a form of networking to the significant benefit of the world community. Human beings are distinguished by a special complementary capacity for service, which, when properly exercised, can renew the quality of the environment and promote the well being of all peoples. It is necessary to break down the barriers between the social partners influencing environmental health, and to promote a science of the heart where the complementary capacity for service in each individual is recognized, appreciated and encouraged.

Soft Science and Networking

"The managers view of reality exerts profound effects upon his every managerial act. His act in turn affects the achievement of both his own goals and those of the organization of which he is a member." Douglas McGregor

The Commission of the European Communities Directorate General XII for Science, Research and Development recently announced its 1991 1994 Environment Framework Programme. The framework contains a radical change from previous programmes and for the first time promotes research in areas which have been referred to as "soft science". Research proposals related to the environment are invited in areas such as:

- integration of environmental concerns in enterprises;
- perception of nature;
- cultural, ethical, religious and philosophical aspects;
- societal learning processes;
- socio economic indicators;
- management practices.

The inclusion of approaches touching on the wisdom of the ages drawn from culture, philosophy and spiritual perceptions is in recognition of a growing concern with the inadequacy of a mechanistic science of the head and the strongly held belief found in people generally that behind the world of appearance there is a deeper world to be looked at.

The city of Cologne and this area of Germany have a great tradition of excellence in science, philosophy and theology. In the 12th century Hildegard of Bingen outlined her understanding of the world. She argues that "the earth must not be injured, the earth must not be destroyed", it evokes joy, wonder, praise, awe and especially love. Her approach delights in the "greening of the Earth" and her writings have been recently translated into many languages and are popular with those interested in ecology.

The importance of the Greek philosophers in their examination of man and nature was communicated to Europe in large part by St Albert the Great and St Thomas Aquinas out of Cologne. "Absence of haphazard and conduciveness of everything to an end are to be found in nature's works in the highest degree" we read in Aristotle's "On the Parts of Animals". St Albert argues for an alliance between science and faith and St Thomas Aquinas gave us a profound philosophy of being which gets to the heart of all created things.

Can we have hearts of flesh and not of stone? The global environmental crisis is real. Can we have a global viewpoint combined with a deep concern to ensure that the application of science in enterprise development renews the environment and enhances the quality of human lives? Edith Stein, who lived in the Lindenthal sector of Cologne, observes in her work "The Problem of Empathy" that "the least mishap in our environment tends to excite us much more strongly than a catastrophe in another part of the world without our mistaking which event is more significant"(p 105) {Zum Problem Der Einfühlung, p 117}. We are all subject to influences that may distort our vision and Edith Stein was herself a victim of the Holocaust because of a heartless science which could not recognize the worth of people.

be found a love stronger than death and a resource that can read the signs of our times. I am convinced that the environmental catastrophe that threatens can draw from the deep resources of the hearts of people and bind together the social partners, individual and corporate, in applying science and technology in a new world order.

This binding together is the crown of effective networking. Technology centres have set in place a collaborative activity involving concerned multidisciplinary teams. Distrust, antagonisms and selfishness which impel this planet to the brink of destruction are replaced when people exercise that special complementary capacity for service. The organisers of this conference are to be congratulated for promoting cooperation in environmental technology at an international level at this time of great challenge. May your commitment to development prosper because your work is of vital importance.

****

Endnote

Fred O'Brien, Honorary Vice President of IFEH, now resides in Kilkee, County Clare, Ireland. He delights in the beauty of the local setting and is awed by the reality that all elements of the natural order concur in generation and conservation. In the following images drawn from a lecture by the renowned astrophysicist Arthur Eddington, he provides a mathematical and poetic model of the generation of waves by wind. This physical phenomenon is much evident in the local seaside town of Kilkee. These images are but two of the many 'models' that humans draw-on in exploring the real world and the physical environment on which our health relies. The full text of Eddington's lecture is found at:

http://www.giffordlectures.org/Browse.asp?PubID=TPNOPW&Volume=0&Issue=0&ArticleID=17

The Generation of Waves by Wind:

Mathematical Model:

Maintenance against viscosity, by suitable forces applied to the surface.

If the external forces p'_{yy}, p'_{xy} be given multiples of $e^{ikx + at}$,

where k and a are prescribed, thence the value of η.

Thus we find where σ^2 has been written for $gk + T'k^3$ as before....

a wind of less than half a mile an hour will leave the surface unruffled.

At a mile an hour the surface is covered with minute corrugations due to capillary waves which decay immediately the disturbing cause ceases.

At two miles an hour the gravity waves appear.

"Our theoretical investigations give considerable insight into the incipient stages of wave-formation".

Poetic Model: [From Rupert Brooks poem: *The Dead*]

There are waters blown by changing winds to laughter

And lit by the rich skies, all day. And after,

Frost, with a gesture, stays the waves that dance

And wandering loveliness. He leaves a white

Unbroken glory, a gathered radiance,

A width, a shining peace, under the night.

IFEH 12th World Congress on Environmental Health
Vilnius, Lithuania
21st – 27th May, 2012

LUHE

www.ifeh2012.org

Dear Colleagues,

The Organizers of the 12th World Congress on Environmental Health have a great honour and pleasure of inviting you to take part in this Congress to be held on **21st-27th of May, 2012**, in Vilnius, Lithuania.

The Congress will focus on the most relevant issues that reflect the main theme of the Congress – **"New Technologies, Healthy Human Being and Environment"** including traditional topics and aspects of environmental health, such as health impact and health risk assessment, noise and electromagnetic fields impact, food safety and public education. The Congress will touch as well new challenges to public health - such as information technologies, gene engineering, new epidemics, climate change and other.

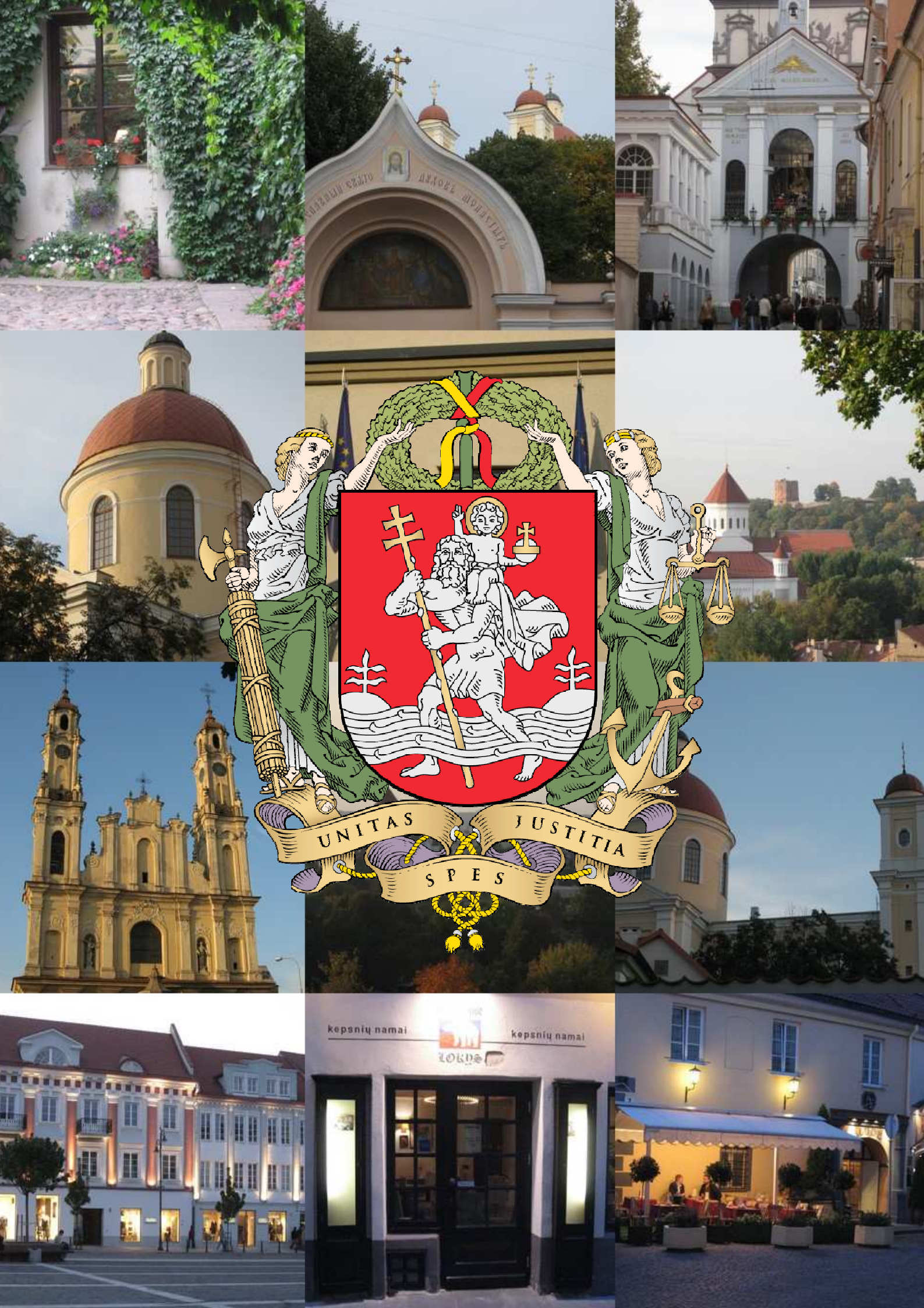
Vilnius, the historical capital of Lithuania, dating back to the 14th century, has the most beautiful and the largest old town, awarded with the status of World Cultural Heritage by UNESCO, with Vilnius University being the oldest one in Eastern Europe. It is rapidly expanding as a modern European capital, so you can experience the harmony of the old and the new Vilnius. For the participants of the Congress this will provide beautiful atmosphere and the mood for work and friendship.

We look forward to meet you in Vilnius in 2012!

With warm regards,

Viktorija Montviliene
Chairperson
Lithuanian Union of Hygienists and Epidemiologists

Venue
The Congress will take place in Radisson Blu Hotel Lietuva. The hotel is situated on the bank of River Neris in the center of Vilnius, only a 10-minute walk to the Old Town.


UNITAS
JUSTITIA
SPES
kepsnių namai
kepsnių namai