E&HI Environment & Health International

Magazine of the International Federation of Environmental Health

Volume 12: Issue 2 December 2010

ISSN 1683-3805

A word from the IFEH President

Robert Bradbury

Hello. My name is Robert Bradbury. I am from Victoria, British Columbia, Canada and this will be my first article in the Environmental Health International Journal since taking over as President of the International Federation of Environmental Health at the 11th World Congress held in Vancouver, Canada this past September.

I would like to start by thanking our previous President, Bernard Forteath of the Royal Environmental Health Institute of Scotland (REHIS) for his leadership and dedication these past two years. I have enjoyed working as President-Elect under Bernard's direction. He has assumed the position of Public Relations Officer of the Federation and will be Chairing the Communications Committee. We look forward to Bernard's continued support. I would like to take this opportunity to welcome our new President-Elect, Dr. Peter Davey of Environmental Health Australia (EHA) onto the Board of Directors. Those of you who attended the World Congress in Vancouver would have had the opportunity to meet and speak with Peter. He also was Chair of the 10th World Congress in Brisbane, Queensland. You may also be familiar with Peter through his endeavours at Griffith University in Brisbane. Peter will be Chairing our Membership Committee.

The 11th World Congress was the first World Congress to be held in Canada and I want to sincerely thank Domenic Losito, Congress Chair; Claudia Kurzac and Jasmina Egeler, Congress Co-Chairs and their terrific team of volunteers for the excellent educational programs, social venues and networking opportunities afforded all delegates. This Congress was held jointly with the Annual Educational Conference of the Canadian Institute of Public Health Inspectors (CIPHI) and hosted the British Columbia Branch of CIPHI. I would like to recognize and thank the large number of environmental health students who volunteered to assist with the Congress and we look forward to welcoming them as practitioners and hope to see them at the 12th World Congress in 2012 in Vilnius, Lithuania.

Just a couple of quick words on where I see the 'where to next' for the Federation. We have expanded the Board of Directors to include the Regional Chairpersons and we have recently established two key Committees that should help drive the organization into the future, those being Membership and Communications. These two committees are inextricably linked and should provide the backbone and underpinnings to further position the International Federation of Environmental Health as the global leader and spokesperson on the international environmental health stage. This leadership has already been well articulated through the various organizational policy statements that have been developed. But we must do more if we are to continue to attract new members and broaden our horizons! By increasing the membership of the

Board of Directors this should support and enhance communications and decision making.

The Federation, like other associations of environmental health professionals exists for its members and to continue to provide global environmental health leadership, we need to increase the number of environmental health organizations and academic institutions into the fold. Global environmental health issues know no geographical or political boundaries. I would also encourage each of you to become an individual member of the IFEH.

Another area where we can improve and enhance communications is with the Faculty Forum. Over the next two years, I hope to strengthen and enhance our working relation ship with the academic community as we continue with the development of professional competencies.

I welcome your input and thoughts as we go forward together into the future. May I take this opportunity to wish all of our colleagues and their families the very best of the holiday season and a bright and successful 2011.

Photos: IFEH World Congress Opening Ceremony, Paul Markey

Photos: IFEH World Congress, Larry Beasley

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.

IFEH World Congress Photos:

All photos related to the IFEH World Congress held in Canada can also be viewed via the official website at www.ifeh2010.org

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Editorial

Hadrian Bonello

A few weeks ago I was clearing out my old collection of dvd movies and I came upon a movie that most of you might have seen. This movie is about a sudden change in the earth's core that drastically changed the climate by starting a catastrophic and rapid shift of the Earth's weather. Obviously there is always a solution to every scenario and though the story line may be far fetched, thinking about it may hold some truth to it.

Mankind has evolved into super intelligent beings, but for all our inventions, breakthroughs and milestones meant to make our world better, it's ironic that we have also made it worse. Whether you choose to believe or not, we've entered the doorstep of global environmental transformations that will change the way we live. Leading the pack is the issue of global warming.

Global warming is the phenomenon of continually increasing average temperature of the Earth's near-surface air and oceans. Its causes are attributed to several things, including volcanic eruptions and changes in the Earth's orbit around the sun, but perhaps its most striking root is the presence of greenhouse gasses in our atmosphere, like methane and carbon dioxide. These gases trap the sun's heat, not letting it escape back to space. The more greenhouse gases there are, the more heat is trapped inside the earth's atmosphere, and the warmer our world gets. This conclusion is backed up by tremendous research and has been endorsed by at least 30 scientific societies and academies of science, together with all of the national academies of science of chief industrialized nations.

Some people would argue global warming is not real, but just some science fiction catastrophe scenario conjured up by scientists to scare people off. The seemingly invincible arctic ice is breaking off into huge chunks faster. Because of this, ocean levels are rising, and the earth absorbs more sunlight and gets even hotter. Arctic shrinkage and glacier retreat have also been observed.

Mother Nature's cycles have been disturbed, and erratic weather occurrences are evident all over the world. Notice too that the amount and pattern of rain fall has changed in many parts of the world. Hurricanes have become stronger,

storms more intense. Drought and wildfires, flooding and heavy snowfall are also prevalent. Global warming also affects biodiversity, bringing about species extinctions. The increased temperatures also cause changes in agricultural yield and changes in the occurrence and spread of disease. The range of potential disease transmission increases and duration of transmission season also change, affecting the overall intensity of outbreaks.

Global warming is now a household name, and everyone seems to be aware of it at least to some degree. Efforts to lessen if not eliminate harmful substances that contribute to global warming take form in recycling and use of fuel alternatives like biogas and eco-friendly energy sources like solar and wind power.

I think global warming started by accident, like some kid who thought fire was cool and ended up burning his house. Well we haven't burned down our planet yet and we still have time to make sure we don't. If we haven't yet, we need to realize that to survive, we must protect the Earth. Global warming is a threat, but also an opportunity to change for the better.

The Royal Environmental Health Institute of Scotland (REHIS): International Essay Competition

Earlier this year The Royal Environmental Health Institute of Scotland (REHIS), a Founder Member of the International Federation of Environmental Health, celebrated its 135th birthday and decided to mark the occasion by launching an International Essay Competition for students of Environmental Health across the world. The set topic was: How would you raise the profile of environmental health and make its delivery more relevant to government and policy makers over the next five years?

The aims of the competition were:

- to raise the profile of international environmental health issues
- to encourage student Environmental Health Professionals to consider Environmental Health in a global perspective, and

to promote the work of the Federation as the global umbrella organisation for environmental health.

Competition entries were assessed by a panel of distinguished international environmental health academics and the panel determined that the winning entry was submitted by:
Claudette Parker-Allotey from Edmonton, Alberta, Canada.
Claudette is a final year undergraduate student at Concordia University College of Alberta on the Environmental Health After-Degree programme. Claudette will receive £500.00 and a personalised certificate and her submission will be published in the winter edition of the REHIS Journal *Environmental Health Scotland*.

The Runner-up was Gwyneth Kerwin from Stoneyburn, West Lothian, Scotland. Gwyneth graduated in June this year from The University of Strathclyde's BSc (Hons) Environmental Health degree course.

John O' Connor from Edenderry, Co. Offaly, Ireland and Sammy Wafula Simiyu from Nairobi, Kenya received commendations. John is an undergraduate student about to enter the 2nd year of the Dublin Institute of Technology BSc Environmental Health degree course. Sammy is a 3rd year undergraduate student at the Kenya Medical Training College on the Diploma in Environmental Health Sciences course.

All entrants will receive a personalised certificate.

The Royal Environmental Health Institute of Scotland offers its congratulations to Claudette and takes this opportunity to thank Koos Engelbrecht (South Africa), Barbara Delaney (Ireland), Harold Harvey (Northern Ireland), Tony Grimason (Scotland) and Steve Konkel (USA) for acting as the competition assessors.

Photo: Claudette is photographed being presented with the winner's award at the 11th World Congress on Environmental Health in Vancouver by Rod House, REHIS President. Also present are Bernard Forteath, President of the International Federation of Environmental Health and assessors Barbara Delaney and Koos Engelbrecht.

Photos: IFEH World Congress, Royal Canadian Mountain Police: Margaret McGrath, Lindsey Smith

Photos: IFEH World Congress, Nick Losito, Canada & Bernard Forteath, Scotland

Photos: IFEH World Congress, Steve Cooper, Northern Ireland, Olga Bitzikos, Canada

Photos: IFEH World Congress, Irish Contingent

Photos: IFEH World Congress

Photos: IFEH World Congress, Australian Contingent

Photos: IFEH World Congress

Photos: IFEH World Congress, Bernard Forteath, Samantha Nutt

Photos: IFEH World Congress, Hand over to Vilniuus Lithuania

Environmental Health Officers' Association hosts Educational Event:

'Risk Assessment in Focus' with Keynote Speaker Professor Sir. Pennington

Ms. Lisa Fitzpatrick PRO ,

EHOA, Ireland

On the 5th of October 2010 over 150 members of the Environmental Health Officers' Association converged at the Aviva Stadium, Dublin for an educational seminar entitled Risk Assessment in Focus. This educational event, concentrating specifically on risk assessment within the food industry was aimed at members of the Association which is primarily made up of environmental health officers working on the ground.

Photo: *Sir Professor Hugh Pennington, Professor Martin Cormican*

The EHOA felt this was an ideal opportunity for Environmental Health professionals to gain a greater understanding of risk assessment within the food industry. The EHOA were delighted to facilitate such a distinguished panel of experts to speak with Environmental Health professionals about past experiences, lessons learned and the latest thinking on assessing risk when it comes to food borne pathogens.

The Venue

The EHOA decided to have their first educational event at the Aviva as it is a certifiably sustainable venue. The stadium has started its journey towards becoming a certifiably sustainable venue and is working towards BS8901 certification. BS8901 is a sustainable management system for events and event venues; it is currently a British Standard but is likely to become an international standard ISO20121 in 2012. Some of the sustainable issues being used include:

- Rainwater harvesting – positioned on the east stand with a 320,000 litre capacity
- Heat recovery (from the diesel generators) – Pipe work from the cooling circuit on the generators 'absorbs' the heat produced by the generator for use in heating the water supply for bathrooms, kitchens and the under-pitch heating system.
- Waterless urinals - with approximately 400 urinal spaces, on one event day alone there is a saving in excess of 20,000litres of water.

- Energy and water meters - Metering to monitor and manage consumption.
- Acoustic panelling - All plant and equipment specified to not exceed 53 decibels at 1 meter away from the façade (this is equivalent to the noise emitted by an office laser printer).

The Theme of the Event

Risk Assessment is integral to the work of Environmental Health Officers (EHOs) who have been at the frontline, regarding the prevention of food borne illness by conducting, among others, inspections of food business, investigating and containing illness outbreaks and regularly taking action in the removal of unsafe foods from the market. Environmental Health Officers conduct essential and fundamental work, ensuring that public safety measures are maintained. However, increased awareness of the effects of food hazards on human health coupled with the increasing importance and rapid growth of world food trade, the analysis of the risk(s) associated with food have become more important then ever before.

Keynote Speaker

Keynote Speaker Professor Sir. Hugh Pennington, the prominent microbiologist based in the UK discussed the ever important role of environmental health in protecting public health. This presentation was an insight into the Public Inquiries into Ecoli O157 outbreaks in Scotland and Wales and what Environmental Health professional can learn from such outbreaks.

Background

Professor Pennington led a number of notable public inquires including the 1996 E.coli 0157 Scottish outbreak where 21 people died. He also chaired the Public Inquiry into the 2005 outbreak of E.coli 0157 in South Wales where 157 cases were identified, 31 people were hospitalised and one child died. Professor Pennington discussed what lessons Irish Environmental Health Officers can learn from these outbreaks.

Photo: Shane Keane Chairperson, Caitriona Stack Duty Chairperson, Jennifer Shorten Honorary Secretary, Sir Professor Hugh Pennington, Lisa Fitzpatrick PRO, Stephen Murphy Honorary Treasurer

According to Professor Pennington "E.coli O157 is a particularly nasty organism but it can be prevented from causing infection. It has not gone away; it remains a potential threat to people's health. There are no specific treatments available to prevent the onset of complications which are often severe and sometimes fatal. Prevention is paramount."

This EHOA Educational Event also featured a presentation by Professor Martin Cormican, Director of Medical Microbiology; National University of Ireland Galway entitled 'VTEC an Irish Perspective'. This presentation gave the group an interesting look into the risk of VTEC in the water ways in Ireland including private water supplies, group schemes and private wells.

Other speakers included

Mr. Denis Keily—Presentation entitled Risk Management Principles and Guidelines and

Ms. Rita Maloney Principal Environmental Health Officer & Professor Kris A. Willems - Presentation entitled Vital Impact of Viruses of food safety risk management

Photo: Professor Kris A. Willems, Shane Keane Chairperson, Ms. Rita Maloney & Denis Keily

Developing Capacity in Female Academics teaching Environmental Health in Southern and East Africa

The African Academy for Environmental Health

Ten female academics from higher education institutions offering environmental health across Southern and East Africa recently participated in the 2010 HERS-SA Academy in Cape Town during September 2010. The members of the group were supported through the Africa Academy for Environmental Health grant for Developing Gender Equity in Higher Education Institutions offering Environmental Health. Project funded by the Association of African Universities MRCI grant.

The purpose of the grant is to empower women in the environmental health profession by giving them greater self-confidence, wider networks, and a greater ability to use

information and resources to allow effective participation in the higher education forum. This is particularly pertinent in environmental health as it remains a male dominated profession despite the fact that many of the pertinent issues in environmental health predominantly affect the female gender.

The ten participants were from 8 countries and were: Dr Tracy Morse (project coordinator) and Christabel Kambala, University of Malawi; Dr Margaret Keraka (Project co-coordinator), Kenyatta University, Kenya; Dr Vera Ngowi, Muhimbili University, Tanzania; Margaret Macherera and Annah Anusa, National University of Science and Technology, Zimbabwe; Patience Tirelo, University of Botswana; Thabsile Nkambule, University of Swaziland; Ruth Mubeezi, Makerere University, Uganda, and Ingrid Mokgobu, Tshwane University of Technology, South Africa.

They joined eighty three women from thirty universities situated in Africa, the United States and Mauritius who spent a week at the University of Cape Town Graduate School of Business in focusing on key aspects of higher education. The annual HERS-SA Academy brings together women in middle management or senior positions with leadership experience and those with leadership potential to participate in a dynamic, week-long professional development programme.

"The HERS-SA Academy aims to provide women with knowledge and networks to encourage them to aspire to and apply for the most senior positions in higher education institutions" said Dr. Sabie Surtee, Director of HERS-SA. "Currently women are underrepresented in positions at leadership levels. HERS-SA is committed to seeking gender equity across all occupational levels within higher education institutions as this is where our leaders of tomorrow are being educated."
Morning plenary sessions provided a big-picture understanding of the higher education environment and the academic and administrative challenges facing universities.

During the afternoon delegates were able to choose from a wide selection of workshops focused on individual career development. Members of the AAEH group facilitated two workshops during the Academy addressing the Interface between Environmental Health and Higher Education, and Gender Mainstreaming in Higher Institutions of Learning. These were well received by both EH and non EH academics.

In addition to the formal sessions, informal networking enabled delegates to interact with and learn from, colleagues from 16 South African universities, 12 universities from other parts of Africa and from one institution in the USA and Mauritius respectively. Discussions were lively and stimulating.

Christabel Kambala from the University of Malawi said "*I found it a worthwhile experience with rich and refreshing information*".

The team who attended the Academy has a programme of activities for the coming 12 months to build upon the personal development and concepts from the HERS-SA Academy.

These include:

- The distribution, analysis and reporting of a questionnaire addressing gender based issues in environmental health in higher education.
- The development and facilitation of regional workshops for female academics teaching in environmental health programmes to address areas such as research development, teaching and learning techniques and gender mainstreaming.
- Development of regional electronic forums to facilitate mentoring, research collaboration and open discussion on issues pertaining to environmental health.

Community involvement in malaria control in Swaziland

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Abstract

Community involvement is a process of establishing participation and cooperation between government and the community where communities participate in planning, implementation, use and evaluation of projects intended for community benefit. This study was conducted to determine the extent of community involvement in malaria control in Swaziland. A descriptive study design utilising standard survey methods was conducted in two communities affected by malaria in Swaziland. A systematic random sampling was used to select 424 households from Lomahasha and Lavumisa. One adult in-charge of each household participated in the study.

It was found that communities were not involved in planning, implementation and evaluation of malaria control activities. The respondents indicated that they were neither participating in malaria control resources mobilisation nor were they contributing anything significant towards malaria control. About 73% of interviewed respondents believed that malaria control activities were the responsibility only of the Government of Swaziland. The results also showed that communities were not participating in drugs issuing, yet literature has demonstrated that with proper training, communities can handle and issue malaria treatment drugs, with no significant adverse effects. Lack of organized community training in malaria control and the negative perception of the Swaziland Malaria Control Unit personnel on community involvement in malaria control activities were identified as factors hindering community involvement. This is viewed as an important limitation in the malaria control endeavour in considering the evidence-base which reports the considerable benefits of involving communities in malaria control.

Key words: Environmental health; community involvement; malaria control; public health; Swaziland.

Introduction

Malaria is a communicable disease that could affect masses of people in endemic areas (Malaviya et al, 2006). It is transmitted by Anopheles mosquitoes (Frobisher, 1983; Arnold and Lentnet, 2007). Anopheles mosquito species need fresh, stagnant or slow flowing water and human blood for breeding purposes at above 18 0C and an altitude of less than 700 metres above sea level (Snow et al., 1999, Toure and Mario, 1999). The malaria parasites account for 99% of malaria cases in Africa, Swaziland included (Snow, 1999; WHO, 2000a; Swaziland Malaria Control Unit, 2000).

The treatment of malaria by drugs is gradually failing due to the resistance of the malaria parasites to the medicines (Revaonjna-hary, 1996; Muhe Lulu, 2002). Many studies have been conducted around the world, with findings concurring with those of Revaonjna-hary (1996). This means that an alternative to drug use should be found soon to combat malaria, if control or

eradication of the disease is to be achieved. Many initiatives have been proposed by international organisations to combat malaria in Africa. These include the Global Malaria Control Strategy of 1992, WHO Africa Regional Malaria Control Strategy of 1996, the African Initiative for Malaria Control in early 1998, and the Roll Back Malaria of July 1998 (Chatora, 1999). In all the above named initiatives, emphasis was mainly on community involvement and the States' support (Chatora, 1999; ARCHI, 2001).

Community involvement refers to a process of establishing participation and cooperation between government and the community where communities participate in planning, implementation, use and evaluation of projects intended for community benefits (Oakley, 1989). In community involvement, the community is part of the decision-making process and takes actions to solve problems that affect their health (Oakley, 1989; Spradley, 1990; Williams, 2002). Alnwick (2001) and Abdur (2003) considered community involvement as a key to community health and development. Communities could actively participate in spraying of their houses with DDT intended to kill adult mosquitoes and, hence, reduce greatly the exposure per person to the insecticide, compared to the present system where one person is employed to spray many houses. Alnwick (2001) suggested that communities should be mobilised to demand, as individuals and groups, involvement and access to interventions for malaria.

The old traditional way of malaria control, where control was the responsibility of government agencies only, is now outdated. Medical Service Corporation International (2000) demonstrated through a study on community participation that communities are a resource that is cost effective in removing breeding ground for mosquitoes. This is achieved by a sustained, extensive training of communities, and encouraging them to be involved in malaria control activities (Medical Service Corporation International, 2000).

Among the many studies that have been conducted on community achievements in malaria control, is one that was conducted by the World Health Organization in Kenya where communities were mobilized to use insecticide impregnated mosquito nets (IMN) and actively participate in vector control (Bebe, 1996). Through community mobilisation and education, malaria control strategies were implemented in schools, work places and households. The results were that communities fully participated in the removal of breeding grounds, and the use of mosquito nets was increased from 17% to 33% in one year. There was a marked reduction in clinical consultation by children under five years, and a drop in severe malaria. The same benefits were reaped by Burkina Faso, Congo, Benin, Mali and Ethiopia when the same strategies were used (WHO, 2000b; Morrow and Kindane 2000; Ethiopia Ministry of Health, 2008).

Malaria situation in Swaziland

It is estimated that more than half of the Swaziland population is at risk of contracting malaria. This is in consideration of the population living in malaria endemic areas, and population predisposed to intermittent malaria epidemics (Swaziland Ministry of Health and Social Welfare, 2001). The Swaziland Malaria Control Unit annual report (2000) estimated that on average, about 50 people died of malaria, and 30,000 cases of malaria were reported per annum. These statistics only referred to cases reported at health facilities (clinics and hospitals). Deaths that occurred in the communities were not included and were estimated to be 10% of the total malaria deaths (Swaziland Malaria Control Unit, 2000). It is also expected that, due to global warming, the existence of Anopheles mosquitoes is likely to spread to areas previously known to be malaria free (WHO, 2001). This might increase the population at risk of contracting malaria in Swaziland. Swaziland has suffered prolonged drought since 2002 (IRIN, 2008) and because rainfall has a direct impact on mosquito breading, there has been a significant decline in the malaria cases. The issue of drought in Swaziland has given a false impression that the country is winning the war against malaria. The Malaria Unit is even contemplating malaria eradication in the country as opposed to control (Williams, 2002). This is because in 2007 only five people died of malaria in Swazi-

land (Global Health Report, 2008).

Investigation of community involvement in malaria control

The Swaziland Malaria Control programme alone cannot achieve its objectives without community involvement (Lal, 1998). This is because all the interventions carried out by the programme require community co-operation (Medical Service Corporation International, 2000). For example, in the case of drugs treatment, the community must be willing to report the onset of malaria early, for the treatment to be effective. Indoor sprayings require that communities allow the spraying unit to spray their houses and be prepared to tolerate the discomfort caused by the insecticide. The use of insecticide-treated bed nets implies that communities must be prepared and be willing to cooperate in using the nets (Ethiopia Ministry of health, 2008). Dr Phetsile Dlamini, the then Minister for Health in Swaziland, in her speech of 22nd July 2002, when opening a malaria conference, referred to community involvement as a pillar of community education, diseases control and eradication. Thus, community involvement holds the key to malaria control and eradication in Swaziland (Alnwick, 2001; Opiyo, 2007). As such, it was deemed imperative to investigate the community involvement in malaria control in Swaziland to ascertain the options for alleviating the scourge of the disease. The specific objectives of the investigation were to: determine community involvement in malaria control activities; determine the extent of community involvement in malaria control activities and identify factors that hindered or promoted community involvement in malaria control activities.

Methodology

A descriptive study design utilising several standard survey methods was conducted in two communities affected by malaria in Swaziland.

Population and sample

The study targeted communities in Swaziland that are in the malaria endemic areas. Convenient sampling was used to identify two locations one that was considered to be most affected and another that was less affected. According to Swaziland Malaria Unit annual report (2000), the most affected areas in Swaziland are Lomahasha and Big Bend. Lomahasha was selected from this category. Lavumisa was selected from the less affected areas. There are 2 000 household at Lomahasha and there are 1 000 household in Lavumisa. A systematic random sample of 250 homeholds from Lomahasha and 250 household from Lavumisa was selected. In each household, one adult who was considered to be in-charge of the household (mother, father, grandmother or grandfather) participated in the study. In the absence of these, a senior person in the household was selected.

Instrument development

The study collected both primary and secondary data. The instruments used consisted of interview schedules, observation checklist, and diary and secondary data checklist. The interview schedule was developed from literature review, opinions arising from consultations with experts in malaria control and community participation. It consisted of items intended to measure community involvement in malaria control activities, the extent of community involvement, and the factors hindering or promoting community involvement in malaria control.

A panel of experts reviewed the interview schedule and attested content validity. The interview schedule was pre-tested in 35 selected households in Big Bend to establish the reliability of the instrument. The observation checklist and diary were used for recording anecdotes during visits to the communities, with a view to observing the involvement of communities in discussing, planning or implementing malaria control activities. The secondary data checklist was obtained from reports and other documents on community involvement in malaria control activities in Lomahasha and Lavumisa.

The researchers carried out observations during the malaria season (December- March). Communities in the study areas were visited to observe and record on-going activities pertaining to malaria control, with a view to gauging the extent of community involvement. The re-

searchers also visited the Ministry of Health and Social Welfare and Malaria Unit offices, to collect secondary data from records.

Results

Demographical information

424 respondents were interviewed out of 500 expected; giving an 84.8% achievement, 70 of the respondents refused to be interviewed and 6 questionnaires were spoiled. 58% of the respondents were from Lomahasha and 42% were from Lavumisa. Male were 60% and females were 40% of the total respondents that were interviewed. 76% of the respondents had a formal education, and 24% had no formal education.

Involvement in needs assessments, resource mobilisation and existence of community committees

All respondents interviewed mentioned that there had never been malaria control needs assessment and resources mobilisation (that the community was aware of) carried out in either Lomahasha or Lavumisa. Also there were no community committees that were tasked with resources mobilisation, nor community based, anti-malaria programmes in the study areas. 90% in Lavumisa and 67% in Lomahasha believed that an establishment of malaria community committees in the malaria areas was likely to promote community participation in malaria control.

Community training in malaria control

Respondents in both study areas revealed that there had been no community training on malaria control and disease surveillance. The small percentage (0.4%) that indicated they were trained on aspects of anti-malaria interventions, on further inquiry, were found to be Rural Health Motivators (RHM). All respondents' interviewed (n = 424) indicated that malaria control was the responsibility of the Swaziland Government and the Swaziland Malaria Control Unit based in Manzini. This finding indicated that the perception of the community towards malaria control activities was negative and communities did not identify themselves with the malaria control measures. However, on examination of their knowledge on malaria prevention, 80% in Lomahasha and 45% in Lavumisa indicated possession of knowledge in the prevention of malaria. On further inquiry about how the knowledge was acquired, the response was that experience taught them and some knowledge was gathered from mass media and spray men.

Members of community contributing towards malaria control

In Lomahasha, 53.7% and 29.78% in Lavumisa agreed that, they contributed towards malaria control. Those who claimed to have contributed indicated that they only provided water for the spray men during indoor house spraying and nothing else. Communities did not contribute any labour, material, or money towards anti-malaria activities.

Participation in malaria control activities

The results indicate that the communities did not participate in malaria control in project initiation, planning, implementation and evaluation. The only participation that existed was fetching water for the spray-men.

Support from traditional leaders and modern structures

In the Swazi society community participation in an activity is enhanced when community leaders are involved or support that activity. Community members were asked whether the traditional leaders and modern structures were supportive towards malaria control. At Lomahasha communities rated traditional leader's involvement as very poor and rated RHMs (79%) and clinics (94%), as supportive and participating towards malaria control indicating support from modern structures (Figure 1.0). *Refer to page 22.*

At Lavumisa, respondents agreed that, RHMs (72%) and clinics (88%) took the lead in the support of anti-malaria activities. Respondents rated the traditional leaders' of the chiefdoms (Chiefs, Tindvuna, Tibomdza and Buchopho) at 50% supportive of the antimalaria activities (Figure 2.0). Refer to page 22.

Factors that hindered community involvement in malaria control

There was a perception among the community members that communities are not involved in malaria control because the Swaziland Malaria Control Unit has a feeling that communities may misuse the malaria treatment drugs if they were allowed to fully participate in malaria control. When this perception was explored, 69% of the respondents in Lavumisa and 44% in Lomahasha rated the fear of drug misuse by communities as greatly hindering community involvement in malaria control (Figure 3.0). *Refer to page 22.*

Community perception about lack of training

Figure 4.0 shows that in Lavumisa, 86% of the respondents and 60% in Lomahasha rated lack of organised training for communities on malaria control as greatly hindering community involvement in malaria control. 88% in Lavumisa and 92% in Lomahasha believed that creation of awareness through organised training of communities on malaria control activities among traditional leaders was very likely to promote community involvement in malaria control. *Refer to page 23.*

Publicity

95% in Lavumisa and 91% in Lomahasha believed that publicity of malaria control measures by the Swaziland Malaria Control Unit through the mass media was very likely to promote community participation in malaria control.

Staffing in the Swaziland Malaria Control Unit

In Lavumisa and Lomahasha 62% and 30% respectively, rated shortage of manpower in the Swaziland Malaria Control Unit as greatly hindering community involvement in malaria control. In Lavumisa and Lomahasha 19% and 22% respectively rated it as slightly hindering (Figure 5.0). 93% of respondents in Lavumisa and 52% in Lomahasha believed that adequate staffing at community level in the Swaziland Malaria Control Unit could promote community involvement in malaria control. 83% in Lavumisa and 51% in Lomahasha believed that if the Swaziland Malaria Control Unit could increase supervision on health care givers and anti-malaria activities that might promote community participation in malaria control. *Refer to page 23.*

Perception of the communities about who is responsible for malaria control

In Lavumisa and Lomahasha 73% and 40% respectively, of the community rated the belief that malaria control was the responsibility of the government of Swaziland, not the community as greatly hindering community involvement in malaria control (Figure 6.0). *Refer to page 23.*

Personnel interviews

The Swaziland Malaria Control Unit personnel when interviewed about community involvement in malaria control were reluctant to give information. However, they did mention that communities participated in malaria control activities by co-operating with spray men, in allowing the spray-men to spray their houses and agreeing not to the remove the chemical sprayed on the wall. The malaria personnel also mentioned that they could involve communities in mosquito-breeding site removal if need be, but they could not involve them in drug distribution and insecticide handling. A malaria manager (Simon Kunene) stated that there was a need to safe-guard against drug misuse, to prevent malaria parasite resistance to the drugs. He cited a problem of misuse of the spray chemicals and hence environmental pollution, as a major reason for not involving the communities in malaria control.

The spray-men were using an insecticide called pyrethroid to spray the walls and outside eaves of the community houses. Community members were seen washing and removing the chemical on the walls after they were sprayed with the insecticides. Community members cited problems of insecticide's smell and fear of poisoning. Some community members were seen locking their houses and running away on seeing the malaria control spray-men. When asked why they were running away from the spray men

community members responded that they did not want their houses to be sprayed with the insecticide. Spray men, had no proper personal protective devices, especially, masks. It was observed that there was no collaboration between the Swaziland Malaria Control Unit and the environmental health programme, yet these two programmes are under one administrator (Swaziland Ministry of Health and Social Welfare, 2007).

Discussion

Existence of community involvement

Literature has defined involvement in community programmes as participation in all the levels of programme operations (Oakley, 1989 and Bebe, 1996), the main organs of which are planning, implementation and the evaluation of programme activities. The results indicate that the communities in both study areas are not participating in any of these stages of project development. Communities only partially participate in implementation of the anti-malaria activities by providing water for spraying. To say communities are involved in malaria control they should participate in needs assessments and resource mobilisation (WHO, 2000b). This is important because communities can identify most of the needs, as they know their surroundings and problems better. Communities know what is available within the community and what can be sourced outside (Medical Service Corporation International, 2000). The study revealed that communities do not participate in resources mobilisation and needs assessment. It seems as though the Swaziland Malaria Control Unit does not value the community contributions as there were no reasons advanced to indicate limiting problems in involving communities in these activities.

Factors that hinder community involvement

Education through training of communities is a pre-requisite for community involvement in malaria control. A community will only participate and contribute resources in a programme when they realize a reason why they should participate and that can be effected by training (Medical Service Corporation International, 2000). The results revealed that there has been no community training in the malaria control neither there is any community contribution. The researchers believe that this is a major stumbling block in the community involvement.

Traditional leaders are important people that can play a leading role in community mobilisation and development. The results revealed that there was no support from traditional leaders in Lomahasha (Figure 1.1) and traditional leaders in Lavumisa are 50% supportive of community involvement in malaria control (Figure 1.2) Perhaps this is the reason why Lavumisa is less affected by malaria disease compared to Lomahasha (Swaziland Malaria Control Unit, 2000). These organisations should be used by the Swaziland Malaria Control Unit and the Ministry of Health to mobilize the communities to get involved in malaria control and mobilize resources for malaria control activities within a community. It is encouraging to note that clinics and Rural Health Motivators do support community involvement (Figure 4.2, 4.6 and 4.7); however their community accessibility is limited to community members who come for health services. It was observed that there was no collaboration between the Swaziland Malaria Control Unit and the Environmental Health Programme, yet these two programmes are under one administrator (Swaziland Ministry of Health and Social Welfare, 2007) and are intended to assist communities to access health services. If the two programmes could collaborate great strides could be made in achieving community insolvent in malaria control due to man power sharing as staffing in the Swaziland Malaria Control Unit was cited in the research as a contributing factor of non community involvement in malaria control.

Factors that can promote community involvement in malaria control

The results indicate that there was no community based malaria control programme where communities will participate in decision making processes on malaria activities and resources mobilisation. This could make the communities identify themselves well with the activities. Ac-

tivities like community training and vector control could be easier implemented and sustained with the existence of community based programmes. The starting point should be the involvement of schools, churches, chief and other traditional structures in the discussion of malaria problems and control measures.

Involvement of communities in issuing of anti-malaria tablets would help to increase coverage of treatment hence people would not have to die of the diseases. Results show that communities are not participating in drugs issuing yet literature has shown that with proper training, communities can handle and issue malaria treatment drugs with no significant adverse effects (Morrow and Kidane 2000). The argument of the Malaria Unit personnel that this will cause drugs resistance does not hold water because resistance to drugs is not caused by the fact that the drugs are issued by the community members but by misuse of the drugs. With intensive training and close supervision communities can be an asset to malaria control in terms of providing drugs to the sick (Morrow and Kidane 2000). What is important is the design of strategies as to how this can be implemented in Swaziland. The major activity of the Swaziland Malaria Control Unit is household spraying with insecticide. Communities are not participating in actual spraying yet if the communities were to spray their households that would reduce the exposure of spray-men to the insecticide and would increase coverage of households sprayed per given area per year. Under close supervision community members can be able to do the task.

Conclusions

The conclusion that is drawn from the study is that there is no community involvement in malaria control in Swaziland, but there is some slight participation where individuals provide water for the spray-men. The major causes of lack of community involvement in malaria control were observed to be the following:

The negative attitude of the Malaria Unit towards community involvement. The Swaziland Malaria Control Unit when interviewed was of the view that the malaria control activities should be kept as close as possible within the Swaziland Malaria Control Unit personnel for easy monitoring of chemicals.

There are no programmes that support community involvement. It will always be difficult to involve communities without these structures.

Support from traditional leaders and modern structures are inadequate. What is interesting with the results is that Lavumisa has a low prevalence of malaria cases in comparison with Lomahasha, yet when one looks at the support given by the said structures Lavumisa is more supported than Lomahasha. May be this could be one cause for the differences in malaria prevalence in these areas.

The results also showed that communities were not participating in drugs issuing, yet literature has demonstrated that with proper training, communities can handle and issue malaria treatment drugs, with no significant adverse effects.

Recommendations

It is therefore recommended that:

The Malaria Unit should first establish a community based malaria control programme where communities will participate in decision making processes on malaria activities and resources mobilisation. The starting point should be involvement of schools, churches, chief and other traditional structures in the discussion of malaria problems and control measures.

Communities should be used for activities like indoor spraying and drugs distribution for malaria treatment. It should be mentioned here that a close supervision and proper training of communities is important to avoid problems.

There should be an integration of Swaziland Malaria Control Unit services with the general environmental health programme in order to increase manpower in projects management. The malaria control integration is also important to make sure that malaria services are inline with the health policy of Swaziland and the primary health care concept advocated by WHO of bringing services to people through collaboration and co-ordination of services. This

will not only provide a systematic way of monitoring the malaria control activities but it will also be inline with the primary health care concept of bringing services to the people and allowing them (people) to take charge of the activities (Ministry of Health 2007, Bassert, 1992). This will also enhance collaboration of health service delivery.

Further research on how the logistics of community involvement should be started and how the monitoring of the activities should be done must be conducted.

Acknowledgements

We want to thank the University of Swaziland Research Board for the financial support it accorded us to undertake this study. We also want to extend our gratitude to the Swaziland Malaria Control Unit for the assistance it rendered to us. Finally we want to thank all the people who responded to the questionnaires.

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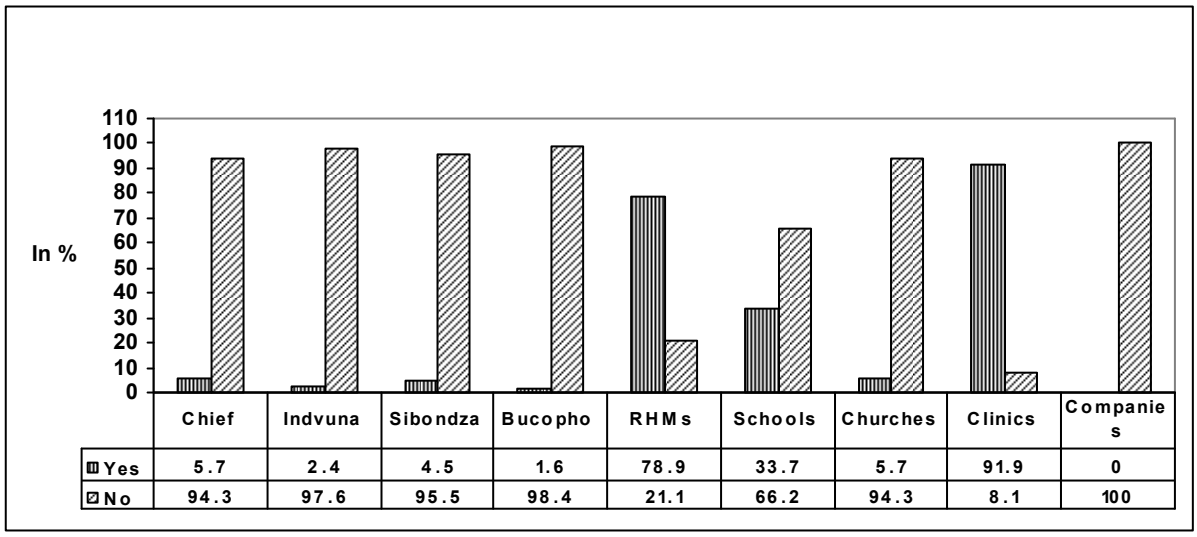

Figure 1.0: Support from traditional and modern structure in Lomahasha for malaria control

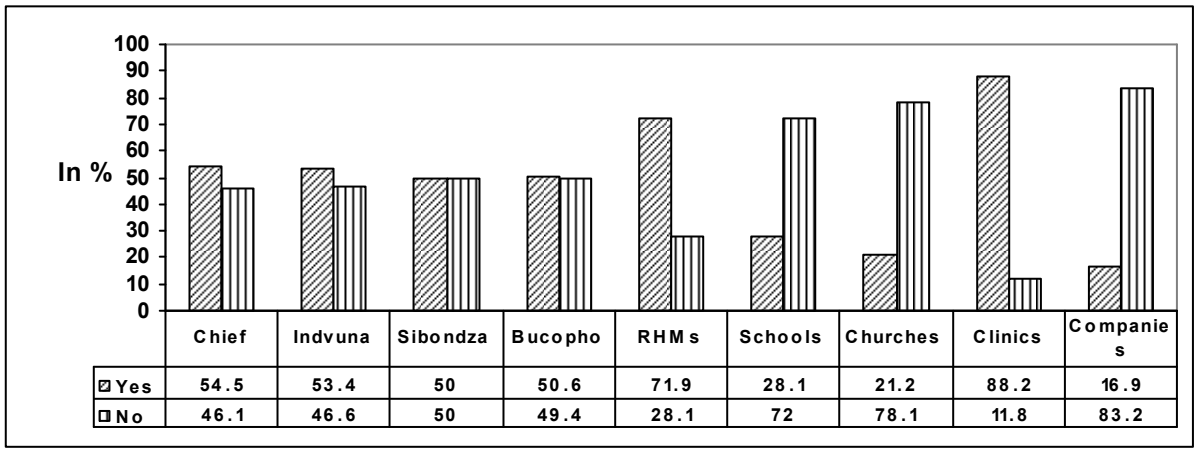

Figure 2.0: Support from traditional and modern structure in Lavumisa for malaria control

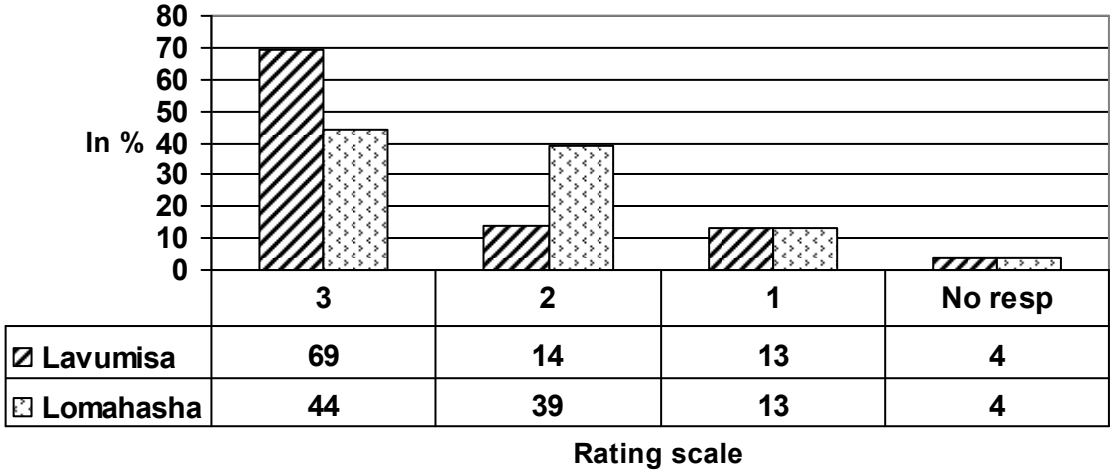

Figure 3.0: Fear of drug misuse

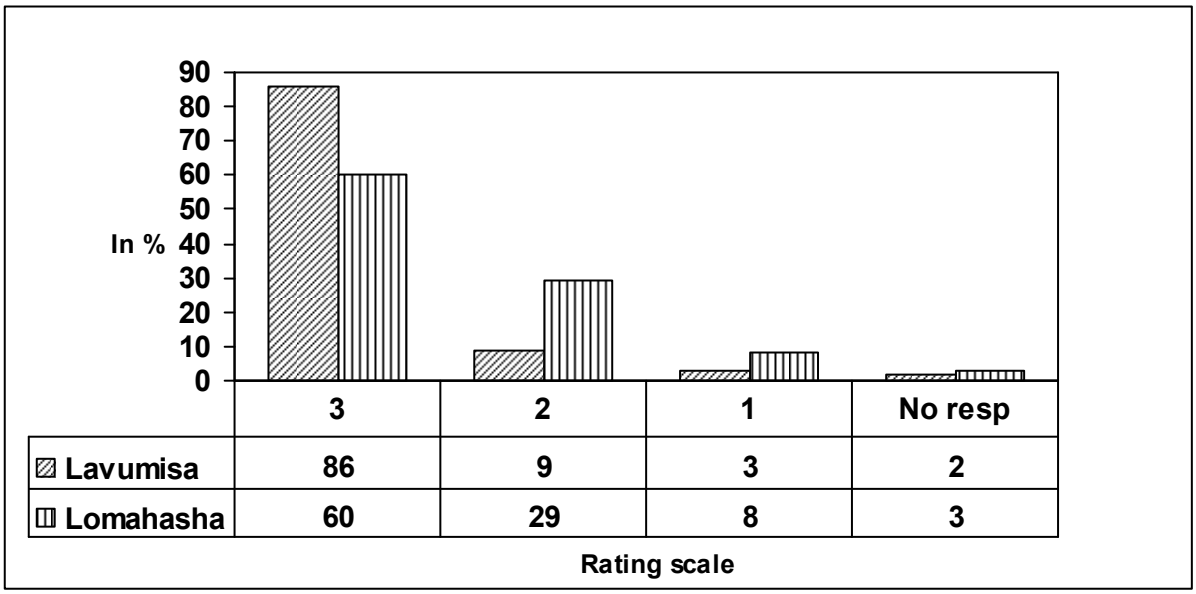

Figure 4.0: Lack of organised training on malaria control

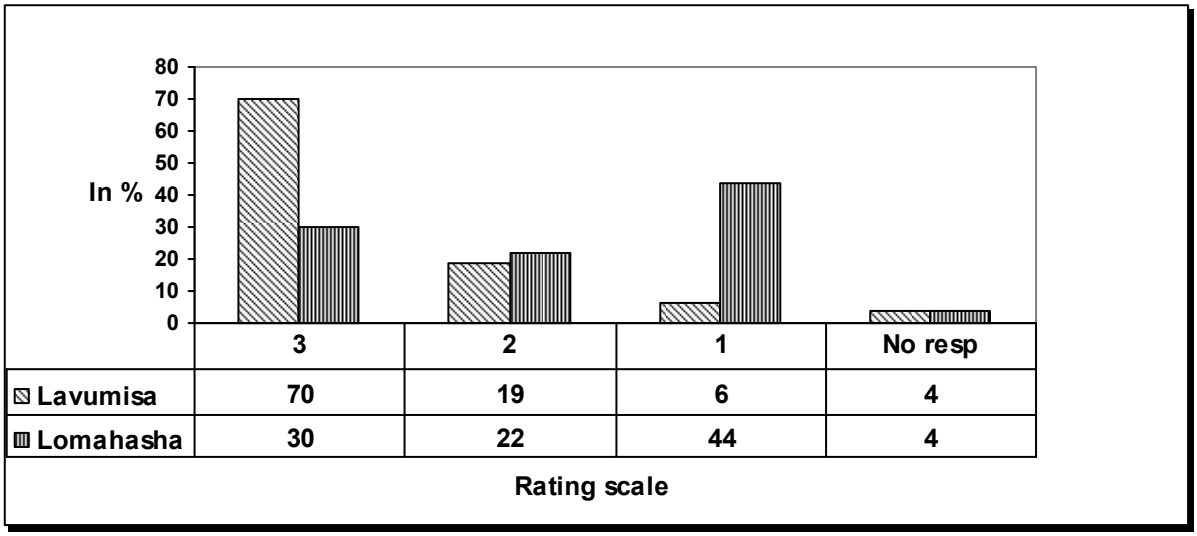

Figure 5.0: Staffing in the Swaziland Malaria Control Unit

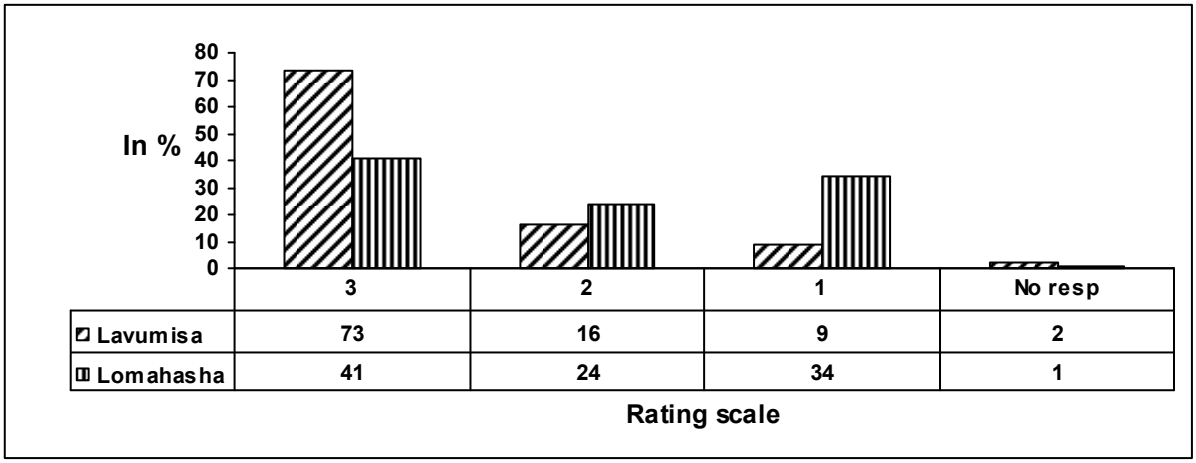

Figure 6. Belief that malaria control is the responsibility of Government

THE IFEH SUSTAINABILITY INDICATOR INITIATIVE – 10 YEARS OF SUCCESS

By Henning Hansen

Project Manager of IFEH Sustainability Indicator Initiative (IFEH SII)
IFEH Council member of IFEH on behalf of EnviNa Denmark

The initiative was launched at the IFEH World Congress in Oslo, Norway in the year of 2000. So by now the initiative has been run for a period over 10 years. In this article I will summarize what have been achieved so far.

The primary aim with the initiative is to collect, disseminate and promote the use of indicators to monitor and assess progress towards a sustainable development.

The landscape of sustainable development indicator systems whose number has significantly grown in number and sophistication over the last decade is full of success stories, but also of continuing major challenges. Indicator systems are key policy tools to define in detail and operationalize the general concept of sustainable development based on shared but differentiated responsibilities.

Indicator systems that help articulate and track progress in fulfilling these responsibilities are fundamental as planning, implementation and evaluation instruments, and also as instruments of communication and coordination across different scales, up to and including the global scale.

In short it can be noted: If you don't know where you are located and where you are coming from, you won't be able to define where you are heading and you won't be able to decide whether you are moving in the right or wrong direction! Only by the use of a comprehensive indicator system you will be able to navigate.

In 2005 IFEH and IISD – International Institute for Sustainable Development - went into a formal collaboration to advance the use of sustainability indicators. The technical motor in the initiative is the web database hosted by the IISD which is accessible from both the IFEH website as well as the IISD website.

Free of charge you can add information on your indicator initiative(s) with a broad focus on sustainability and environmental health and protection or just browse initiatives already included in the Compendium by entering the web database from this link: www.ifeh.org/indicators/compendium

By starting out with the experiences collected from all over the World assembled in the Compendium you will have a very good starting point – and also you have the possibility to disseminate your experience to the World for others to benefit from your experience.

Results so far from the initiative

Below is an outline of the results and important milestones so far.

In the latest 10 years several thousands of participators – primarily professionals and politicians - at national and international conferences around the Globe have been introduced to the underlying ideas and vision behind the initiative and the initiative itself. Many of those are having a great influence on the administration of either a city or a nation, so if only a few percents have taken onboard the underlying ideas the impact of the initiative may well have had an influence related to many millions of people. And by having access to the web based Compendium many more administrative persons – and not only those attending conferences - use the experience from others through the Compendium. As neither the IFEH nor the IISD is alone on this endeavour it is difficult to tell to which extend we have made a significant difference. But I am quite sure that we have made a great difference – and that we should continue and strengthen our effort to keep the good wave rolling.

Latest results (2010 and 2009): November 2010: The initiative was presented as a keynote presentation at the Climate Change & Environmental Management Symposium, hosted by Universidad Nacional Autónoma de México (UNAM) and Griffith University, Australia. The event was supported by the Ministry of Environment, México, the Ministry of Environment, Republic of Indonesia and the IFEH. The Symposium was an important activity of the Academic Sub-Committee of the México Environment Ministry leading up to the COP 16 United Nations Climate Change Convention (UNCCC) being held in Cancun.

The final outcome paper of the Symposium – in which the importance of using sustainability indicator systems was highlighted - was carried on to the COP 16.

November 2010: Leading up to the Symposium in Mexico City the initiative was presented at two universities in Guadalajara, Mexico: Universidad Tecnológica de La Zona Metropolitana de Guadalajara and Universidad Autónoma de Guadalajara.

September 2010: The initiative was presented at the IFEH World Congress in Vancouver, Canada, hosted by CIPHI Canada. www.ifeh2010.org

October 2009: The Initiative was presented at the Third OECD World Forum on Statistics, Knowledge "Charting Progress, Building Visions, Improving Life", Busan, South Korea, www.oecdworldforum2009.org, hosted by the OECD and Statistics Korea in association with United Nations UNDP, European Commission, Organisation of the Islamic Conference, The Bank of Korea and The World Bank.

Results – overview (2000 – 2010)

1. The launch of the initiative at the IFEH World Conference in Oslo (2000)

2. Formation of the IFEH working group on IFEH Sustainability Indicator Initiative (SII-working group)

3. IFEH Policy Statement No.8 - "Declaration on the Use of Sustainability Indicators".
   Link:
   www.ifeh.org/docs/ifeh_policies/policy8.pdf

4. Formal collaboration with the IISD MoU between the IFEH and the IISD - COLLABORATION TO ADVANCE THE USE OF SUSTAINABILITY INDICATORS

5. Through the co-operation with the IISD access to use the web database – the Compendium – to house initiatives.
   Link:
   www.ifeh.org/indicators/compendium
   or www.iisd.org/measure/compendium

6. With by now 940 entries, the Compendium is one of the most extensive sources of information on sustainable development indicator initiatives around the world, as recognized by the OECD at the OECD World Forum 2007, Istanbul.

7. The IFEH signing the Istanbul Declaration (the OECD, the European Commission, the Organisation of the Islamic Conference, the United Nations, the UN Development Programme and the World Bank)
   Link: www.oecd.org/oecdworldforum

8. Promotion of the initiative:

   The initiative has been and still is being promoted through the IFEH website – through the IFEH Magazine "Environment & Health International" – through newsletters and through many IFEH member organisations.

   The list of great conferences around the World where the initiative has been presented is very extensive: IFEH World Congresses in Vancouver, Brisbane, San Diego, Durban, Dublin starting up in Oslo, All Africa Conference on EH Nairobi, Irish EH Conference Belfast, Lisbon Technical University Portugal, European Expert Summit on Indicators - Vilnius, Lithuania, EU Expert Summit (European Common Indicators) - Brussels, UN World Summit on Sustainable Development, Johannesburg SA, OECD Second World forum on Statistics, Knowledge and Policy - Measuring the Progress of Societies, Istanbul – Turkey, OECD Third World forum on Statistics, Knowledge and Policy – Busan, Korea, Climate Change & Environmental Management Symposium, Mexico City and Guadalajara, Mexico.

What can be done by each IFEH member organisation and associates:

Each member organisation and associates is called upon to make the indicator initiative and especially the initiative website www.ifeh.org/indicators/compendium known to all its individual members and the institutions that the individual members represent. This can be done by having a visual link from your website and by informing about the initiative through your magazine or newsletter, and by doing so encouraging local, regional and national bodies to use the Compendium – both for searching information – but also to use this platform to disseminate information to the World Society whenever a new indicator initiative is launched.

The Compendium which can be reached through www.ifeh.org/indicators/compendium and through www.iisd.org/measure/compendium is one of the most extensive sources of information on sustainable development indicator initiatives around the world. Entries in the Compendium are created by practitioners, for practitioners. With the help of all IFEH member organisations this World leading toolbox can reach as much as 60.000+ professionals and the institutions that those represent. And why not use this given and proven opportunity?

Final message

The ideas of "measuring progress" keep on rolling and more and more local as well as national governments see that this way of operating is a necessity in order to set out targetable and relevant objectives based on solid and reliable statistics. Besides being an initiative advocating for the use of sustainability indicator frameworks the initiative is likewise a project on how to achieve transparent decision making processes in societies. This indeed is strongly needed in many countries around the World today - and this goes for both developing as well as developed countries as much still need to be done in order to make progress towards a sustainable development.

3-Day Conference on Environmental Health

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Organizing Committee of International Conference on Environmental Health

Department of Environmental Health -

College of Health Technology of Coimbra, Portugal

NELSON RAFAEL LEITE E SÁ

From November 4th to the 6th an International Conference on Environmental Health (CISA 2010) was held at the College of Health Technology of Coimbra (ESTeSC). It was organized by the school's department of environmental health in collaboration with the health technology colleges of Lisbon, Oporto and the health college of Beja.

There were over 500 participants from 4 continents, many of whom authored the more than 60 papers given at the congress.

The program opened with a plenary debate "Environmental Health: Instruction and the Profession", with the participation of Fernando Fonseca from ABC University of S. Paulo – Brazil, Francisco Castiñeira from Polytechnic University of Madrid and moderated by Helder Simões of ESTeSC. The debate clarified the aspects that unite the 3 countries in terms of instruction in environmental health.

The second topic of the conference was "Emergency management and Public Health", with participation by Sofia Núncio of the National Institute of Health, Ricardo Jorge, Paulo Diegues chief of environmental health from the national ministry, Jorge Reis, European representative and assistant general inspector of the national food safety authority, and Eugénio Cordeiro of the Portuguese departament of public health and planning. From this debate it was concluded that public health is best served through multidisciplinary teams focusing upon prevention, that is, health related education and

information.

The second day of the conference opened with the theme of "Impacts of Climatic Change on Health" and had the participation of two ex-presidents of QUERCUS (the national environmental activist group), the noted environmental activists, José Manuel Palma and Francisco Ferreira and Eduardo Silva of the national commission on climate change, and also Isabel Lança of the department of public health and planning for the central region. One of the high points of the conference was discussion from a scientific perspective, on diverse global resolutions in regard to well publicized data on global warming and CO emission.

Then within the perspective of the labor force, the last debate revolved around the theme of "Emerging Risks in Occupational Health". Undoubtedly, one of the high moments of the congress, highlighted the papers of two well known academics, Garcia Pereira and José Pinto da Costa. The former, a lawyer phrased questions with special clarity, calling attention to labour relations and health safety on the job. Doctor Costa, for his part addressing the conference in an extraordinarily communicative way, spoke of industrial accidents and subsequent compensation through forensic examination. Participating further in the debate with a paper on research into occupational sickness was Doctor Nuno Castelo Branco, as well as Manuela Calado of the national council of health and work safety and hospital administrator João Aguiar Coelho. Accompanying the main program in a well realized format were tens of research projects, presented orally or in poster form which greatly enhanced the 1st International Conference on Environmental Health.

The conference finished on Saturday with a dialogue between broadcast journalist Arminda Deusdado and Sandra Cóias (an actress and environmental activist), adding a freer lay and activist point of view rather than a scientific discussion of the relationship of the citizen to the environment. The meeting terminated in a leisurely and friendly walking tour of the historic zone of Coimbra for all participants.

Note that the Congress was hoisted by the

General Director of the Portuguese Environmental Agency which won the green flag for its renewal of the Eco-Schools award, consolidating the epitome of ESTeSC as the only Eco-Schools of higher education in the world.

This 1st conference was a marked success for the area of Environmental Health and a 2nd conference is being scheduled for Lisbon in 2012.

An Internationally Registered Environmental Health Specialist Qualification (IREHS)

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ABSTRACT

The World Congress of the International Federation of Environmental Health (IFEH) has been a venue where an International Environmental Health Qualification such as a Professional Development, Registration or Certification Program has been considered.
An Internationally Registered Environmental Health Specialist (IREHS) Qualification, as an example, could add an additional level of validated knowledge that does not exist among professionals in areas of the world without a local or national program, as well as provide further insight and perspective for currently credentialed environmental health practitioners across the globe. A systems thinking approach combined with two surveys of the 37 IFEH member organization points of contact, were designed to further explore such a possibility. The results were encouraging. It is asserted that an International Environmental Health Qualification could possibly aid the global shortage of Public Health Workers by establishing more Environmental Health Specialists and therefore help to achieve the struggling Millennium Development Goal (MDG) for Sanitation by 2015. This study is designed to support larger efforts of the IFEH International Faculty
Forum (IFF).

INTRODUCTION

Environmental Public Health practitioners have protected populations from harm for centuries. What has qualified these professionals to perform so well? Through education and experience, the field has evolved due to our ever-changing environment. Abilities have risen commensurate with standards designed to compensate for the worlds evolution. Further qualifications such as professional registrations and certifications have resulted. We have met the challenges of the past and present. What can we do to ensure we meet the public health challenges of the future?

The Bi-Annual World Congress of the International Federation of Environmental Health (IFEH) and the International Faculty Forum (IFF) has been a venue where an International Environmental Health Qualification such as a Professional Development, Registration or Certification Program has been considered during the past several years. However, a consensus has yet to be reached. An Internationally Registered Environmental Health Specialist (IREHS) Qualification, as an example, could add an additional level of validated knowledge that does not exist among Environmental Public Health professionals in areas of the world without a local or national environmental health credentialing program; as well as provide further insight and perspective for currently credentialed environmental health practitioners across the globe.

To assess the validity of an IREHS qualification, a three pronged approach was executed. Research was conducted on the problem of professional preparation in the 21st century related to International Environmental Health and two surveys, utilizing the 37 IFEH member organization points of contact, were designed and implemented.

On July 15, 2009, an electronic request was submitted for official IFEH organizational definitions of Environmental Health (EH). The following EH member organization definitions were received or obtained via research: Canada, Finland, Malawi, Norway, Scotland, South Africa and the United States of America (USA). A qualitative analysis shows similarities.

On September 15, 2009, an International Environmental Health Qualification Electronic Survey Instrument was also submitted to the IFEH. The following 30% participated: Canada, United Kingdom, Finland, Ireland, Kenya, Malawi, Netherlands, New Zealand, Nigeria, Saudi Arabia, South Africa and USA. Over 90% of respondents indicate that an International Environmental Health Qualification should exist and that Professional Environmental Health Specialists would be interested in achieving such a Qualification. Eighty-two percent of respondents thought that the IFEH should sponsor or oversee an International Environmental Health Qualification.

It became apparent during the course of this research and investigation that an International Environmental Health Specialist (IREHS) Qualification could have additional advantages beyond 21st century professional Environmental Public Health development preparation. It could aid the global shortage of Public Health Workers by establishing more Environmental Health Specialists. Additionally, this increase in the number of credentialed Environmental Health Specialists could help to achieve the struggling Millennium Development Goal (MDG) for Sanitation by 2015. Priority and perspective using Systems Thinking revealed (MDG) – Sanitation as Problem 1; the Public Health Worker Shortage as Problem 2 and an IREHS as Problem 3. Problem 3 is a Solution to Problem 2. Problem 2 is a Solution to Problem 1.

METHODS:
Behavior Over Time Graphs:

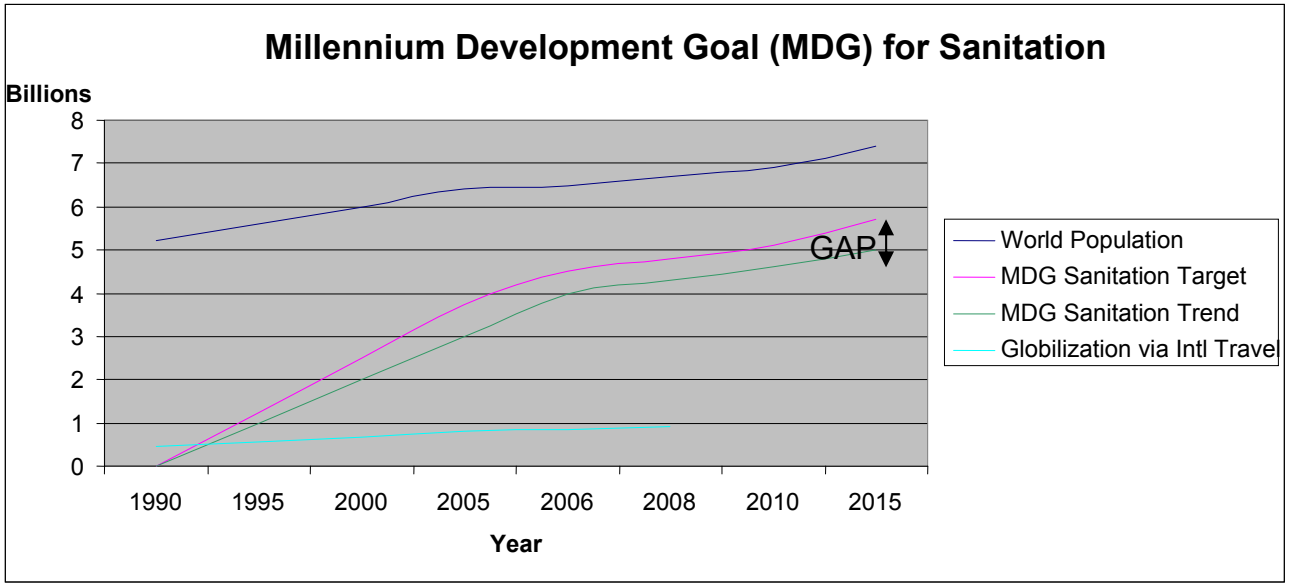

Figure 2: Problem 1: MDG Sanitation Graph (6,7,8)

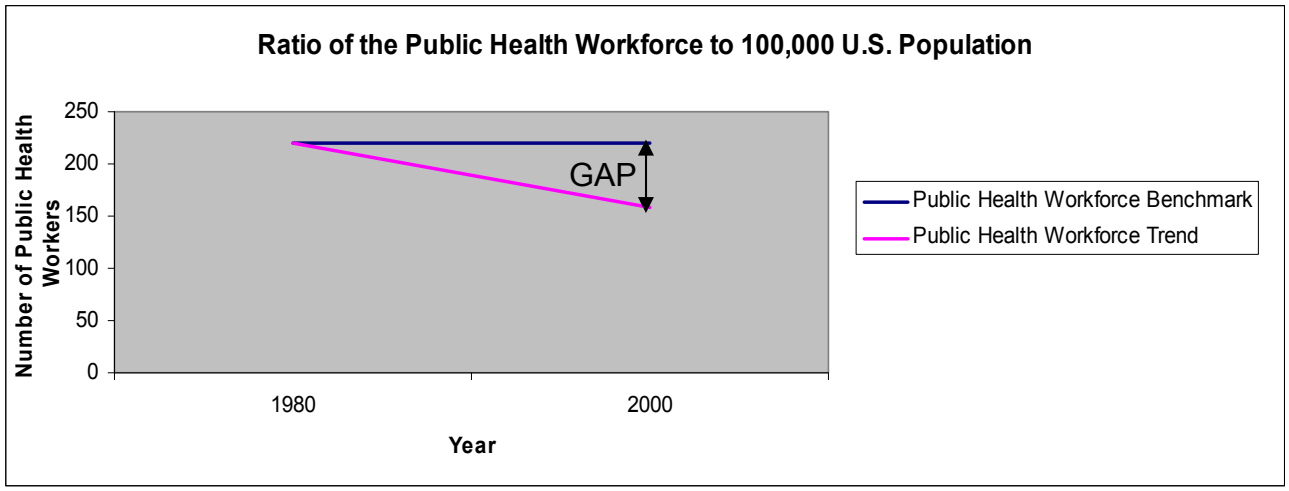

Figure 3: Problem 2: Public Health Workforce Shortage Graph (9)

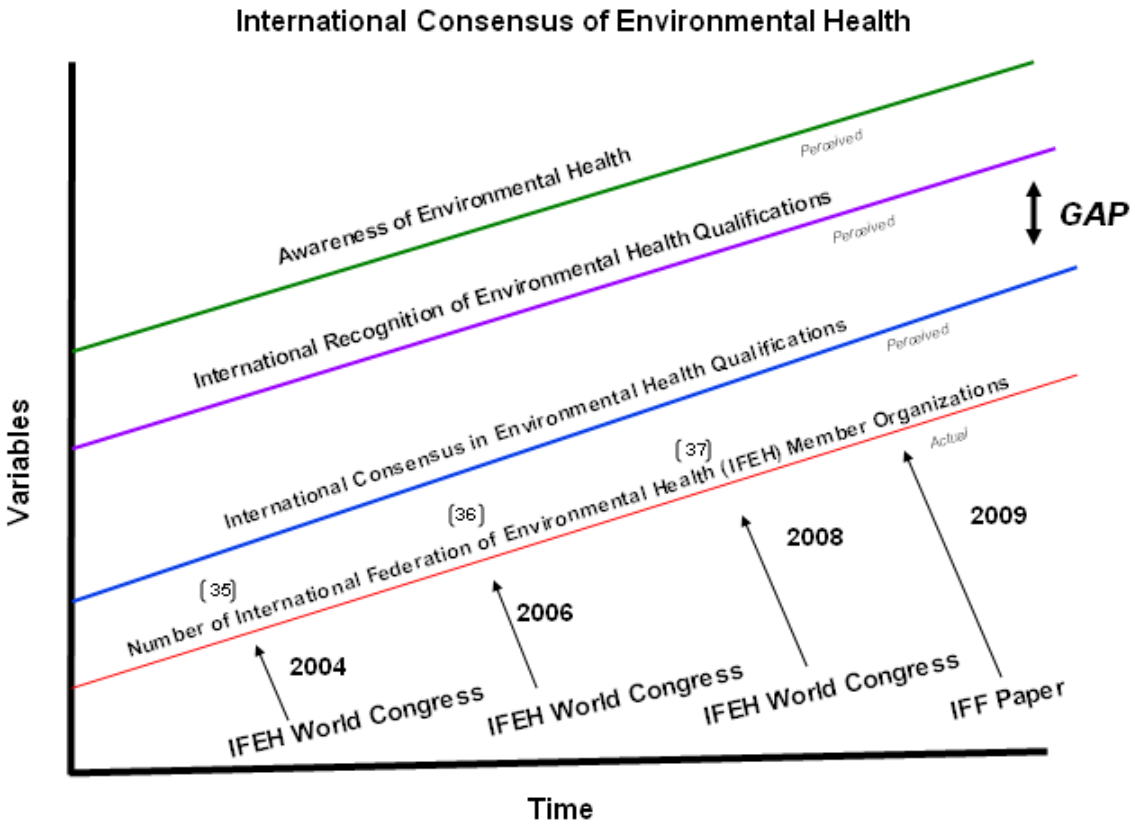

Figure 4: Problem 3: International Consensus on EH (IREHS) (10)

Causal Loop Diagrams and Applicable Archetypes

There are three competing Limits to Success models that could be their own Intervention. One virtuous cycle has an increase in population and globalization with a limiting process and gap of the Millennium Development Goal (MDG) – Sanitation and its Trend (Figure 5). A second virtuous cycle has a decrease in Public Health Career attractiveness with a limiting process and gap of Public Health Workforce Need and Trend (Figure 6). A final virtuous cycle has an increase in IFEH membership and awareness of Environmental Health (EH) with a limiting process and gap of International EH Qualification Recognition and Consensus (Figure 7). A joint condition or performance could be a combined resolution. An Internationally Registered Environmental Health (IREHS) Qualification could help to resolve the other two (Figure 8).

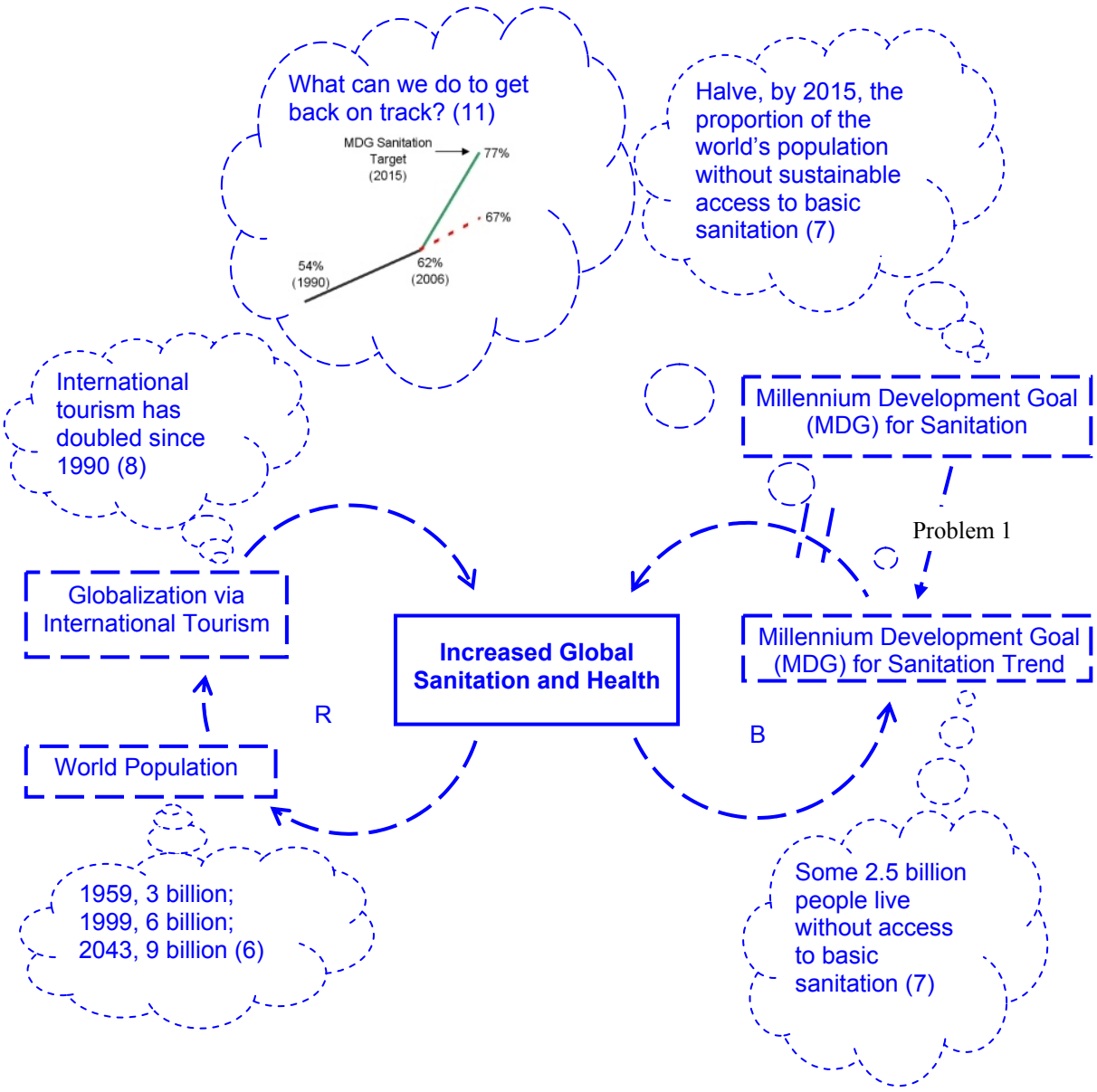

Figure 5: Problem 1: MDG Sanitation, Limits to Success Archetype (6,7,8,11)

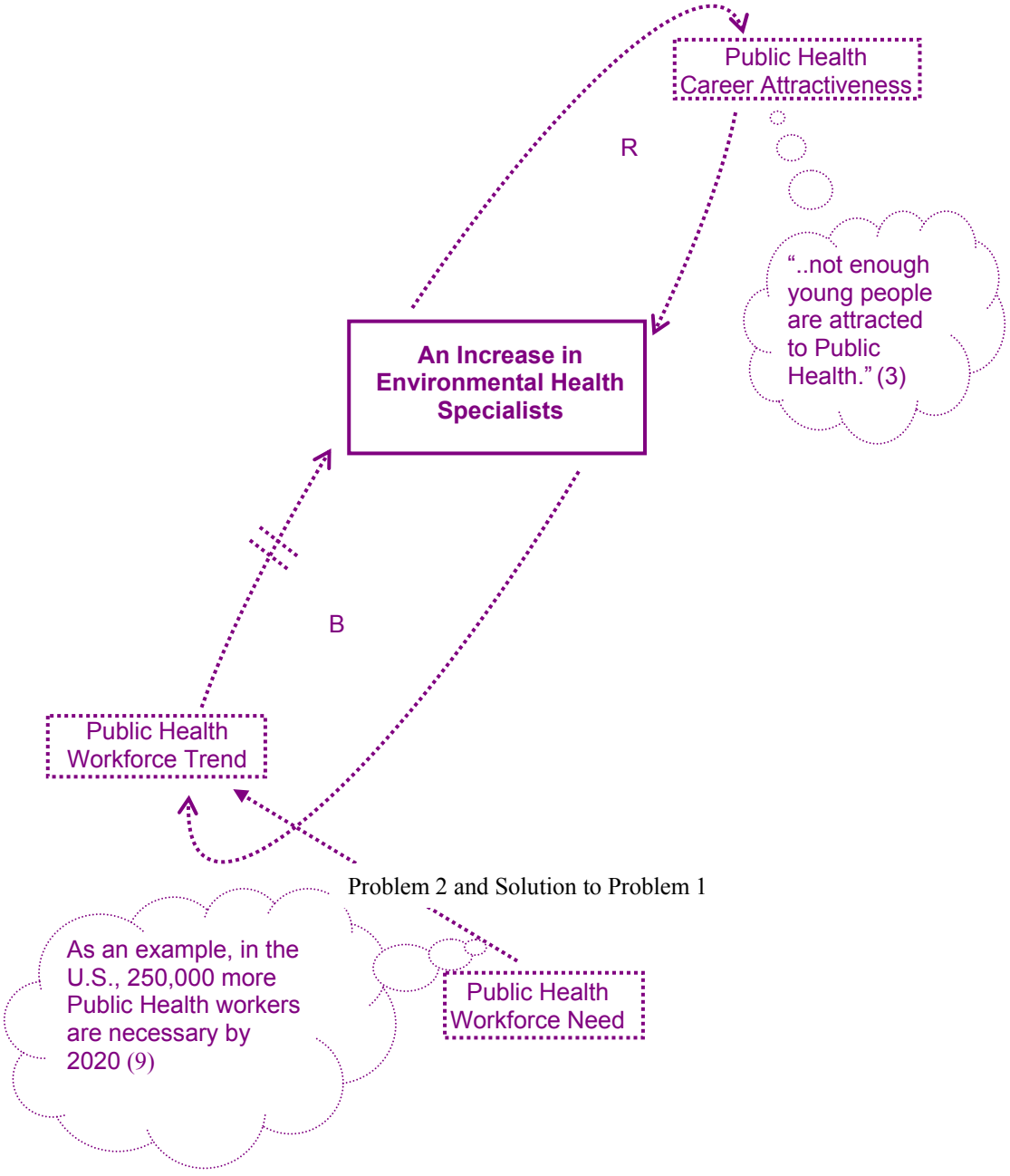

Figure 6: Problem 2: Public Health Workforce Shortage, Limits to Success Archetype (3,9)

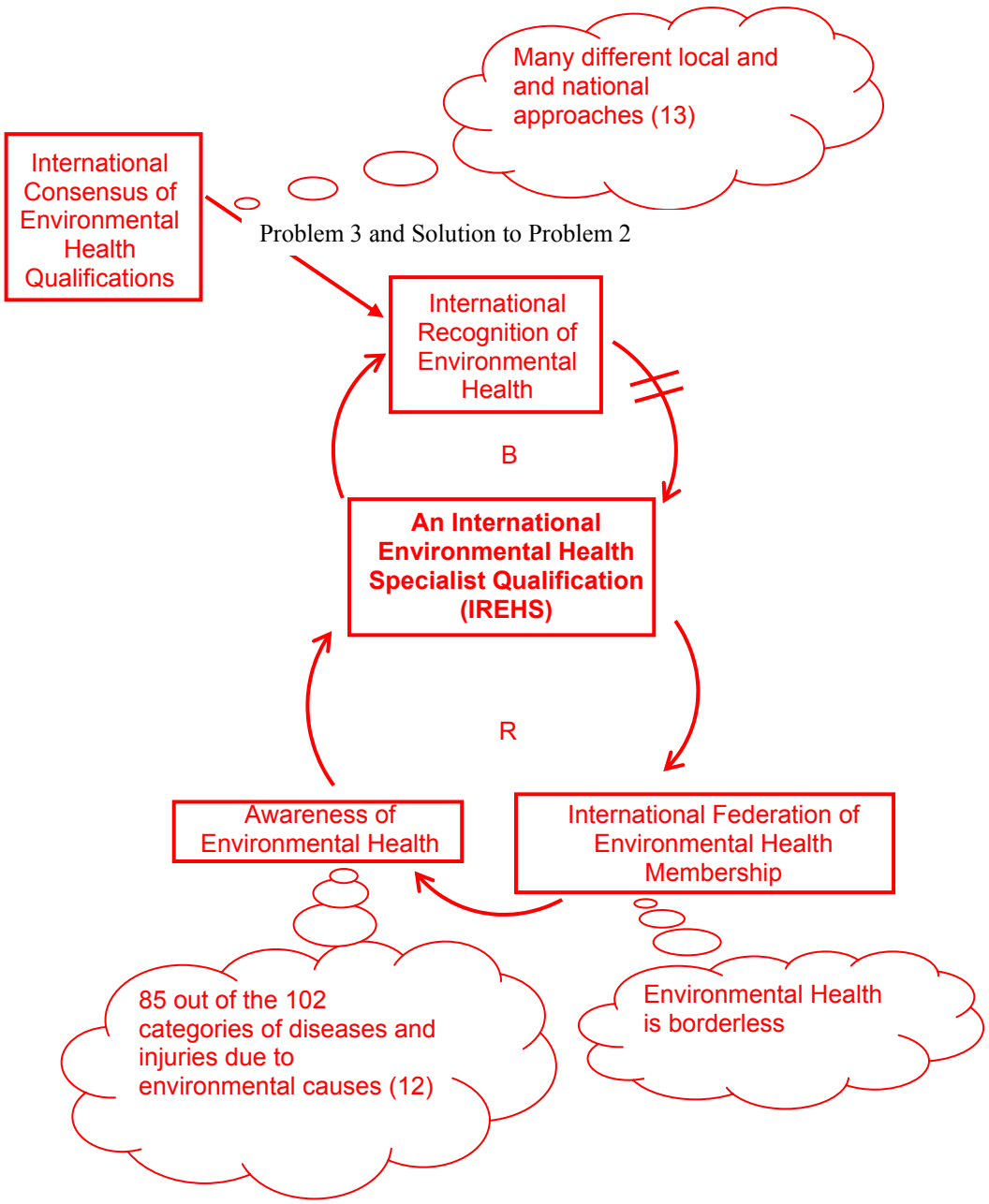

Figure 7: Problem 3: International Consensus on EH (IREHS), Limits to Success Archetype (12,13)

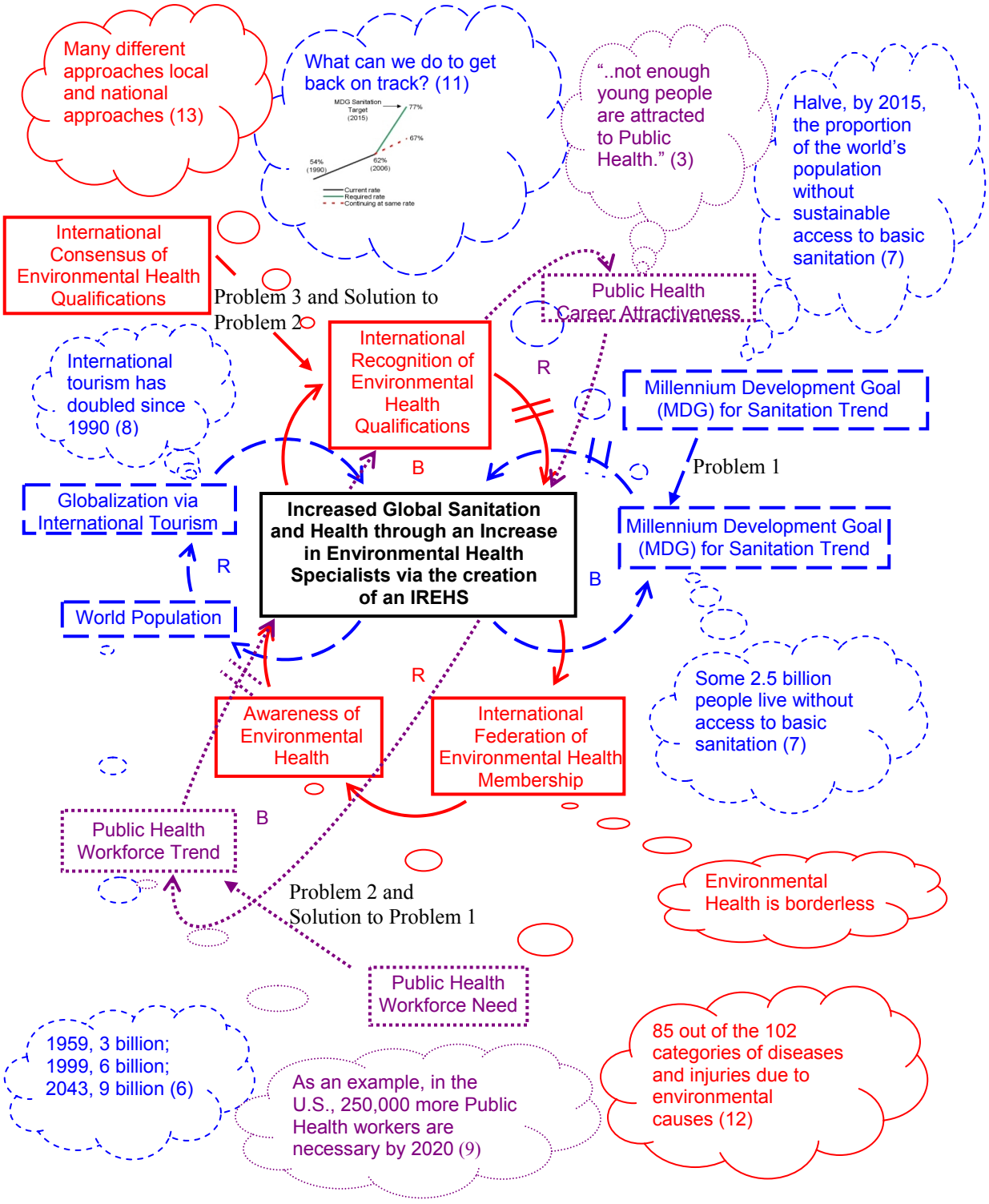

Figure 8: EH is Global, Limits to Success Archetype, a combination of Figures 5, 6, 7 (3,6,7,8,9,11,12,13)

Events and Activities

Event: Research

Activities:
Conduct research on the definition of Environmental Health for each of the IFEH member organizations.
Conduct research and compile an understanding of the global Public Health worker shortage.
Conduct research and compile an understanding of the Millennium Development Goals.
July 15th 2009, an email was sent out to each IFEH Member Organization requesting official EH organizational Definitions of Environmental Health.
August 15th 2009, IFEH Member Organization Environmental Health Definition Submission Deadline.
August 25th 2009, Collective Environmental Health Definitions sent out to each IFEH Member Organization.

Event: Survey Creation and Distribution
Activities:
Creation of Survey Investigating Usefulness of an IEHS Credential Distribution of Survey to Stakeholders for Approval Distribution of Survey to Survey Participants – Members of the IFEH.
September 15th 2009, IFEH Member Organization International Environmental Health Qualification Survey Sent out for a period of one month.
October 15th 2009, IFEH Member Organization International Environmental Health Qualification Survey Submission Deadline.

Event: Survey Results and Distribution
Activities:
Compile results of survey for distribution to Stakeholders and Survey Participants
October 25th 2009, IFEH Member Organization Collective International Environmental Health Qualification Survey Results sent out to each IFEH Member Organization.

Event: Report Results and Distribution
Activities:
Compile report for distribution to CDC, Stakeholders and Survey Participants.
December 15th 2009, Submit Draft Fellowship Project Report to the CDC, IFEH and each IFEH Member Organization for a Feedback and Comments period of one month.
January 15th 2010, Draft Fellowship Project Report, Feedback and Comments period, from CDC, IFEH and each IFEH Member Organizations Deadline.
January 18th 2010, Submission of Final Fellowship Project Report to the CDC, IFEH and each IFEH Member Organization.

RESULTS

On July 15, 2009, an electronic request was submitted for official IFEH organizational definitions of Environmental Health (EH) utilizing the points of contact on the IFEH website. The following EH organization definitions were received or obtained via research: Canada, Finland, Malawi, Norway, Scotland, South Africa and the United States of America (USA). Nineteen percent of IFEH organizational EH definitions are accounted for here. The EH definition of the World Health Organization (WHO) seems to be a composite. A qualitative analysis reveals similarities not only between member organization EH definitions, but also between member organization EH definitions and the WHO EH definition. Table 1 shows these collected Environmental Health definitions. On the most basic level, each definition speaks towards the effort of protecting humans from negative environmental influences that might affect health.

On September 15, 2009, an International Environmental Health Qualification Electronic Survey Instrument entitled 'Should the World have an International Environmental Health Qualification?' was submitted utilizing the points of contact on the IFEH website.
The following 30%, or twelve IFEH member country EH organizations participated: Canada, United Kingdom, Finland, Ireland, Kenya, Malawi, Netherlands, New Zealand, Nigeria, Saudi Arabia, South Africa and USA. Results are shown in Table 2. Slightly less than half of the respondents, at 42%, reported that their Environmental Health Organization sponsored, oversaw or administered an Environmental Health Qualification such as a Professional Development, Registration or Certification Program for their Professional Environmental Health Specialists; and that they thought Environmental Health Studies were

similar around the world. Fifty-eight percent of respondents said 'Yes', Environmental Health Definitions are similar around the world. Only 17% thought that Environmental Health Services were similar around the world. Over 90% of respondents, however, felt that an International Environmental Health Qualification for Professional Environmental Health Specialists should exist and that Professional Environmental Health Specialists would be interested in achieving an International Environmental Health Qualification. Further, over 80% of respondents thought that the IFEH should sponsor or oversee an International Environmental Health Qualification for Professional Environmental Health Specialists. Only 64% of respondents thought that the IFEH should administer an International Environmental Health Qualification for Professional Environmental Health Specialists. Seventy-three percent of the respondents said that they thought their organization would be willing to assist in the development of an International Environmental Health Qualification for Professional Environmental Health Specialists.

DISCUSSION:

Problem 1: MDG – Sanitation. Two point six billion people, or more than 40% of the world's population, do not have access to improved sanitation via connections to public sewers, septic systems, pour-flush and improved pit latrines (1). This leads to a significant global burden of disease (2).

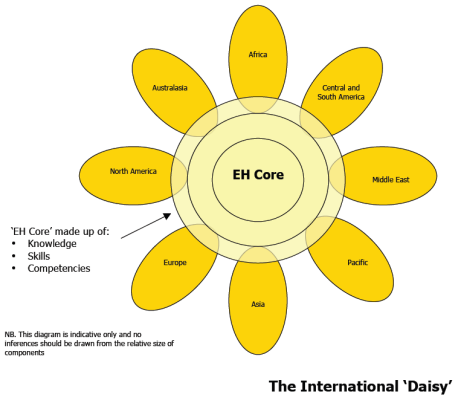

Figure 1: The International 'Daisy' (5)

If an intervention is not conducted, the world will miss the sanitation target by more than half a billion people (1). What can be done about this large gap in access to sanitation? Clearly, additional and more qualified EH professionals are needed to achieve this goal.

Problem 2: Public Health Worker Shortage. The current public health workforce in the U.S is challenged by funding, retirements and recruitment. Therefore, it struggles to support the U.S. and global population. This situation may worsen in the future (3). The current Environmental Health Officer (EHO) workforce in Australia is also not enough to carry out the required tasks of the future (4). There is an unprecedented global need for environmental health specialists due to an increasing scope and decreasing public health workforce in proportion to the population. What can be done about this large gap in workforce development? Could an IREHS could become an X factor in Environmental Public Health recruitment efforts and career enthusiasm due to its international reach and appeal?

Problem 3: International Environmental Health Specialist (IREHS) Qualification. To develop an IREHS, stakeholders may first need to agree that EH is global and EH definitions, studies and services are similar throughout the world. A consensus on an EH core could lead to international recognition an EH specialist. The IFEH and its IFF lead this effort, Figure 1 (5).

CONCLUSION

The quality and quantity of our life is dependent on the quality and quantity of our public health workforce. A continual investment is a continual improvement for all humankind.

This endeavor intended to consider the development of an Internationally Registered Environmental Health Specialist (IREHS). An IREHS concept is not feasible unless a consensus EH core is global and it is supported by an understanding that there are similar EH definitions, studies and services across the globe. The efforts were largely concerned, via research and surveys, with establishing an understanding of International EH definitions and whether IFEH members felt that the World should have an International Environmental Health Qualification. The IFEH and its members are the key stakeholders in this process and their support of this effort is paramount. The IFF team has done a brilliant job up to this point and I am sure they will continue the charge to Environmental Health excellence in the 21st century, whatever the outcome may present.

Not very long ago I was not sure what International Environmental Health looked like, or whether it existed at all. Although I am a Registered Sanitarian (RS) in the state of Kentucky and in the U.S. via the National Environmental Health Association (NEHA), I really had very little global awareness and understanding.

Fortunately, we have many possibilities that accompany our challenges. A systems thinking approach to one problem, I believe, has lead to a solution for two more.

Further survey efforts should be focused on Environmental Health studies and services.
This report has been submitted for review to the IFEH and its member organizations for feedback and will be presented at the next IFEH World Congress in 2010.

With an International Environmental Health consensus at the next IFEH world congress, the UN, WHO and CDC should additionally become involved in this project, due to the possibility of an increasing environmental public health workforce to meet the MDG – Sanitation. By the end of 2015, when yet another goal is achieved, many stakeholders the world over will be enjoying a greater quality and quantity of life. Is it worth the effort to develop an IREHS? After this journey, my answer is 'yes'. If you build it they will come. Besides, what is more important than your health?

Table 1 – Collected Environmental Health Definitions

Canada	The Canadian Institute of Public Health Inspectors: Environmental health is the branch of public health that is concerned with all aspects of the natural and built environment that may affect human health. Other terms that refer to the discipline of environmental health include environmental public health and environmental health and protection (19).
Finland	Finnish Communal Association of Environmental Health and Protection: Environmental health comprises those aspects of human health and disease that are determined by factors in the environment. It also refers to the theory and practice of assessing and controlling factors in the environment that can potentially affect health. Environment and Health, The European Charter and Commentary, WHO, 1990. According to the specifications of the WHO definition, the environmental factors affecting health not only include physical, biological and chemical factors, but also the physical environment and the psychological, social and aesthetic factors of the environment. The Finnish Environmental Health Action Plan has adopted the above WHO definition of environmental health in its broad sense (20).
Malawi	Malawi Environmental Health Association (MEHA): Environmental Health (EH) is the assessment and management of environmental influences (e.g. chemical, physical, biological, social and psychosocial factors) on human health. This entails the study of water and food safety and hygiene (including production, distribution and fitness for human consumption), occupational health and safety (including investigation and control of work-related ill health), communicable disease (including investigation, control and prevention), the built environment (including homes, workplaces and public spaces) and environmental protection (including the control of the air, land and water pollution). EH is about taking a preventative approach to tackling disease and ill-health rather than relying only on the curative approach (21).
Norway	Forum for Miljø og Helse - FMH Norway: Environmental health care concerns all factors known at any time to have direct or indirect effects on health. These include i.e. biological, chemical, physical, and social factors in the environment (19).
Scotland	The Royal Environmental Health Institute of Scotland: Environmental health is that area of Public Health activity which strives to improve, protect & maintain health & well being through action on the physical environment and on life circumstances (22).
South Africa	South African Institute of Environmental Health: Environmental Health comprises those aspects of human health, including quality of life, that are determined by physical, chemical, biological, social and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling and preventing those factors in the environment that can potentially affect adversely the health of present and future generations. (19).
USA	National Environmental Health Association: Environmental health and protection refers to protection against environmental factors that may adversely impact human health or the ecological balances essential to long-term human health and environmental quality, whether in the natural or man-made environment (23)

WHO	World Health Organization: Environmental health addresses all the physical, chemical, and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. It is targeted towards preventing disease and creating health-supportive environments. This definition excludes behaviour not related to environment, as well as behaviour related to the social and cultural environment, and genetics (24).

Table 2 – Collected Environmental Health Survey Responses (25)

Should the World have an International Environmental Health Qualification?	Responses	
Survey Questions	Yes	No
1. Please select your Environmental Health Organization from the list below (12 IFEH member organizations participated, return rate 30%)	NA	NA
2. Does your Environmental Health Organization sponsor, oversee or administer an Environmental Health Qualification such as a Professional Development, Registration or Certification Program for your Professional Environmental Health Specialists?	42%	58%
3. Do you think that Environmental Health Definitions are similar around the world?	58%	42%
4. Do you think that Environmental Health Studies are similar around the world?	42%	58%
5. Do you think that Environmental Health Services are similar around the world?	17%	83%
6. Do you think that an International Environmental Health Qualification for Professional Environmental Health Specialists should exist?*	91%	9%
7. Do you think that the International Federation of Environmental Health (IFEH) should sponsor or oversee an International Environmental Health Qualification for Professional Environmental Health Specialists?*	82%	18%
8. Do you think that the International Federation of Environmental Health (IFEH) should administer an International Environmental Health Qualification for Professional Environmental Health Specialists?*	64%	36%
9. Do you think that Professional Environmental Health Specialists would be interested in achieving an International Environmental Health Qualification?	92%	8%
10. Do you think that your organization would be willing to assist in the development of an International Environmental Health Qualification for Professional Environmental Health Specialists?*	73%	27%

*one participant skipped question

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