



Chemicals Substitution and Management in the Health Care Sector:

A Four-Hospital, Multi-Country Project
in the Philippines and Argentina



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Acknowledgements

We would like to thank the following people and organizations whose contributions have made the completion of this report possible.

GLOBAL

Carolyn Vickers, Susan Wilburn, Lesley Onyon, Tracey Easthope, Ruth Stringer.

ARGENTINA

Daniel Alfano, Miriam Pini, Gabriela Mereta, Alberto Perreta and representatives of Secretary of Health, Rosario; members of chemicals working group and directives at Hospital Roque Sáenz Peña, Rosario; members of chemicals working group and directives at Hospital Rivadavia, Buenos Aires; members of chemicals working group at Secretary of Health, Rosario; representative of personnel from municipal hospitals in Rosario; Verónica Torres Cerino, Nilda Gait and members of the Global Green and Healthy Hospitals Network; María Della Rodolfa, Carolina Gil Posse, and Verónica Odriozola.

PHILIPPINES

Governor Eduardo Firmalo of Romblon Province; Dr. Benedict Anatalio, Chemicals Management Team, management and staff of Romblon Provincial Hospital; Health Care Ministry of Sisters of St. Paul de Chartres Philippines; Sr. Edith Christine Aguirre SPC, Chemicals Management Team, management and staff of St. Paul Hospital Tuguegarao; Engr. Nelia Granadillos of Occupational Safety and Health Center, Department of Labor and Employment; Dr. Socorro Yañez of National Reference Laboratory, Department of Health; Dr. Bu Castro of Philippine Hospital Association; Dominga Gomez of Philippine Hospital Infection Control Society; Michael Angelo Ravago of Philippine Society of Endoscopy Nurses and Assistants; Maria Cristina Paruñgao, and Merci Ferrer.

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Executive Summary

The health sector is a major consumer of chemicals that are well documented to cause serious impacts on human health and environment. The paradox that the health sector is contributing to environmental and public health problems has spurred many hospitals to become leaders in designing strategies to substitute hazardous chemicals with safer alternatives. This report provides the results of an 18-month pilot substitution program for hospitals in Argentina and the Philippines that promotes chemical safety and works toward achieving SAICM's goals.

The benefits of a redefined approach to chemicals use and management in health care are likely to be very broad and preventive in nature. It is difficult to quantify financial benefits but it is very clear that social benefits would be significant.

This project's documentation of hazardous chemicals in health care and piloting their substitution builds on Health Care Without Harm's nearly two decade-long trajectory in promoting environmentally sustainable health care practices. Foundational in this particular effort has been HCWH's work to substitute mercury-based medical devices with safe, accurate alternatives—an initiative carried out in collaboration with the World Health Organization (www.mercuryfreehealthcare.org). Building on the mercury work, this SAICM Quick Start Project has produced results that should prove to be beneficial not only to the participating health care establishments but to other health care facilities, health care systems, and the health sector in general both in the host countries, and globally.

Project Objectives

The overarching goal of the project was to create broad based initiatives in health care in Argentina and the Philippines to generate safe use and disposal of chemicals in the health care sector, in alignment with key international approaches.

More specifically, the project aimed to build momentum toward the adoption of national policies and procedures for substituting hazardous chemicals in health care by

- (1) establishing a model that will be tested in four pilot hospitals in Argentina and the Philippines, resulting in four case studies, and
- (2) educating a broad group of health care staff.

Project Implementation and Outcomes

The project was implemented in parallel in Argentina and the Philippines. In both countries, pilot hospitals were selected and a series of activities were carried out, resulting in a set of key outcomes including:

Argentina

- Two (2) important public hospitals committed to continuing work on reducing their chemical hazards and their contribution to chemical pollution.
- An entire public health system committed to addressing chemical issues progressively in the six (6) hospitals they manage.
- Sound information about chemical hazards and risks associated with hospitals' daily work is now available for hospitals in Spanish via HCWH's website.
- Up-to-date information on chemical hazards is now regularly used in six (6) hospitals.
- Sound information on safer and greener alternatives to hazardous chemicals is now available in Argentina.
- Ethylene Oxide use for sterilization has been reduced in Hospital Roque Sáenz Peña. It is also planned to be soon substituted in Hospital Rivadavia.
- Plans have been established in each pilot hospital and the Rosario public health system to continue phasing out hazardous chemicals and improving management.
- Glutaraldehyde was substituted from 2014 in Hospital Rivadavia.
- Chlorine was substituted from next purchasing process in 2014 in Neonatology Unit of Hospital Rivadavia.
- More than 450 people received training on chemicals risks, substitution and management through hospital workshops, a webinar and a final project workshop.
- Three (3) chemicals working groups were trained to replicate the project in new hospitals in Argentina and potentially, other countries.

Philippines

- Two (2) tertiary level private and public hospitals have participated in the project and will work on developing a more comprehensive chemicals management program.
- Two (2) tertiary hospitals expressed interest in substituting glutaraldehyde and sodium hypochlorite in 2014.
- Twenty-four (24) partner hospitals have started a comprehensive chemicals inventory in 2013 and committed to identify chemicals for substitution and management for 2014.
- Development and implementation of preliminary Laboratory Test Protocols to test efficacy of existing chemicals used in the hospitals and of the proposed alternatives.
- The National Reference Laboratory under the Philippine Department of Health actively worked on the validation of the initial test protocol.
- Compilation of international and national policies on chemicals, together with corresponding chemicals matrix, made available to health care stakeholders and other interested networks via the world wide web.
- Market research of alternatives and networking with alternatives distributors.
- Tool for inventory of chemicals developed and used in hospitals aided in identifying priority chemicals for substitution.
- Information on hazardous effects of chemicals in health care and use of alternatives have been provided to the two stakeholders.
- Stakeholders have gained knowledge in drafting their own Environmentally Preferable Chemicals Plans.
- Development and actual training of the module on “Chemical Safety, Substitution and Management Training for Health Workers” with participants coming from various third and fourth level hospitals from the National Capital Region and selected provinces.
- Conducted a Chemicals Safety Conference in October 2013 attended by various health care facilities, health care systems, professional organization, civil society and government agencies.

Project Outputs

Major outputs of the project include the following:

1. A guidance document (Tool Kit) to support the phase-out of hazardous chemicals in health care facilities (currently in Spanish and to be translated into English).
2. A laboratory test protocol to test alternatives to hazardous chemicals in health care facilities.
3. A training module on chemical safety and management for health care stakeholders.
4. Empowered hospitals that are able to test and substitute hazardous chemicals with safe and viable alternatives.

Next Steps

1. Webinars as well as other trainings will be developed to present the toolkit and educate hospitals in both regions on chemical hazards and opportunities for change.
2. HCWH will continue working with hospitals to help gather their purchasing power to make sure suppliers are required to provide information on chemical ingredients as well as to offer products without hazardous chemicals.
3. Deepen chemical substitution implementation in the pilot hospitals.
4. Broaden chemical substitution to include a broader cross-section of the health sector in each country.
5. Replicate success in multiple countries in each region via HCWH's Global Green and Healthy Hospitals, as well as other relevant networks.

Introduction

The chemical industry contributes significantly to the global economy. The global chemical industry is projected to continue to grow steadily until 2030. Increased use and production of chemicals especially in developing countries are noted to have greater impacts on human health. Engagement by the health sector is critical to the prevention of such impacts.

World Health Organization estimates that more than twenty five percent (25%) of the global burden of human disease can be attributed to preventable environmental factors, including exposure to chemicals. A recent systematic review of the burden of disease attributable to chemicals estimated that, in 2004, 8.3 per cent of the total or 4.9 million deaths and 86 million disability-adjusted life years (5.7 per cent of the total), were attributable to environmental and occupational exposures resulting from the unsound management of selected chemicals.¹

During the 63rd World Health Assembly, it was reported that worldwide statistics show that three percent (3%) of cerebrovascular disease burden and two percent (2%) of ischaemic heart disease burden are attributed to lead exposure. About 800,000 children are affected by lead exposure resulting in lower intelligent quotients and mild mental retardation. Nine percent (9%) of the global disease burden of lung cancer is attributed to occupational exposure while five percent (5%) to outdoor pollution. Estimates of 355,000 people are killed each year due to unintentional poisoning. Such poisonings are associated with excessive exposure to and inappropriate use of toxic chemicals including pesticides.²

The health sector is a significant user of chemicals in health care and health-care facility management. Some of the chemicals frequently used may include biocides and other disinfectants and sterilizers, pesticides for controlling pests on site, cleaning agents, chemicals found in medical devices (e.g., thermometers and electronic devices), pharmaceuticals and pesticides used for controlling disease vectors such as malaria. Recent research has shown that health-sector employees may be more at risk than the general public, from chemicals used in their own workplaces. Among all major occupational groups, the health-sector workers have been reported to have the highest rate of adult asthma and are at a greater risk of developing chronic respiratory illnesses.

The problem of inappropriate use of chemicals and exposure to chemicals is inter-related with social and

development issues of a particular country. Poor living conditions and improper waste disposal make people more susceptible to exposure to toxic chemicals and other pollutants. In developing countries, like the Philippines and Argentina, there is no comprehensive national policy on appropriate use of chemicals and chemical safety.

Most health care facilities in developing countries have weaknesses and gaps in their regulatory regimes, particularly with regard to proper storage of chemicals, management of chemical spills and green chemistry policies, as well as prioritization of safer products in purchasing policies. Availability of proper protective equipment for health care workers is another challenge.

The health sector has a vital role in confronting important issues related to chemical exposure in health care settings. It can effectively demonstrate sound chemicals management practices through research and documentation.

The health sector should also play a stronger role in advocating policies and procedures for the substitution of hazardous chemicals with safer alternatives which do not compromise the health and safety of patients, health workers, professionals and the general public, and which also promote environment protection and conservation.

With the rising concern and need for substitution of hazardous chemicals for safer alternatives specifically in the health care sector, Health Care Without Harm (HCWH) has implemented the project on Chemicals Substitution and Management in the Health Care Sector. The project, financed by UNEP's Strategic Approach for International Chemicals Management's (SAICM) Quick Start Program, was an eighteen month, four-hospital, multi country project in Argentina and the Philippines. Its aim was to pilot chemical substitution and sound chemicals management in order to develop models for the health care sector in developing countries. HCWH Latin America and HCWH Southeast Asia implemented the project in the cities of Rosario and Buenos Aires, in Argentina and in the provinces of Cagayan and Romblon in the Philippines.

The four pilot hospitals are 1) Hospital Rivadavia and 2) Hospital Roque Sáenz Peña in Argentina; 3) St. Paul Hospital Tuguegarao and 4) Romblon Provincial Hospital in the Philippines.

Project Objectives



GOAL:

Build momentum toward the adoption of national policies and procedures for substituting hazardous chemicals in health care by (1) establishing a model that will be tested in four pilot hospitals in Argentina and the Philippines, resulting in four case studies, and (2) educating a broad group of health care staff.

The greater goal of the project is to create broad based initiatives in health care in Argentina and the Philippines to generate safe use and disposal of chemicals in the health care sector, in alignment with key international approaches (SAICM), conventions (Basel, Rotterdam, Stockholm, Montreal, etc.), WHO chemical priorities, Globally Harmonized System of Classification and Labelling of Chemicals (GHS), and others. These efforts can be replicated regionally and potentially globally.

Project objectives include:

- A.** Creating a Matrix of Health Care Priority Chemicals.
- B.** Piloting substitution with safer alternatives in four hospitals in order to test and develop replicable models.
- C.** Promoting good management practices and chemical substitution, which will reduce health care workers', patients', and the community's exposure to hazardous substances.
- D.** Raising awareness in the health care sector in Argentina and the Philippines as to the environmental health impacts of chemicals used in health care.
- E.** Creating educational materials and provide training for health care sector.
- F.** Creating a Final Report documenting the experience of the pilot hospitals in order to promote better practices and chemical substitution in the health sector worldwide.
- G.** Exploring control banding for worker safety.
- H.** Analyze positive and negative financial impacts of chemical substitution and management.

A | Summary of Accomplishments

Main accomplishments of the project in Argentina include:

- There are now two important public hospitals committed to continuing work on reducing their chemical hazards and their contribution to chemical pollution.
- An entire public health system has committed addressing chemical issues progressively in the six hospitals they manage.
- Production and distribution of a comprehensive tool kit in Spanish that contains relevant information on chemicals used in hospitals in Argentina and other countries in the region, their alternatives, model policies to be adopted by hospitals, tools for doing an inventory of chemicals in health care facilities, and more. An international version of this Tool Kit will be published in English in early 2014.
- Sound information about chemical hazards and risks associated with hospitals' daily work is now available for hospitals in Spanish via HCWH's website.
- Up-to-date information on chemical hazards is now regularly used in six hospitals. Two pilot hospitals, Hospital Rivadavia and Hospital Roque Sáenz Peña, and four more hospitals from Rosario, Santa Fe, Argentina.
- Sound information on safer and greener alternatives to hazardous chemicals is now available in Argentina.
- Ethylene Oxide use for sterilization has been reduced in Hospital Roque Sáenz Peña. It is also planned to be soon substituted in Hospital Rivadavia.
- Plans have been established in each pilot hospital and the Rosario public health system to continue phasing out hazardous chemicals and improving management.
- Glutaraldehyde will be substituted from 2014 in Hospital Rivadavia.
- Chlorine was substituted from next purchasing process in 2014 in Neonatology Unit of Hospital Rivadavia.

- More than 450 people received training on chemical risks, substitution and management through hospital workshops, a webinar and a final project workshop.
- Three chemicals working groups were trained to replicate the project in new hospitals in Argentina and potentially, other countries.

B | Details of Activities Conducted

1 -- Create a Health Care Priority Chemicals Matrix

We did a research on the chemicals used in hospitals in Argentina, the availability of alternatives, the characteristics of current practices, etc., and developed the Guide to Phasing-Out Hazardous Chemicals in the Health Care Sector. All this information will also be simplified in the format of a matrix that will be available during the first quarter of 2014. However, during the project we learned that hospital staff needed more background information in Spanish than just a synthesis of it put into a matrix format.

This Guide is a 6 steps tool for hospitals that plan to work on chemicals substitution and management. It includes information about the characteristics of most of the hazardous chemicals used daily in hospitals, where they are found, information on safer alternatives and suggestions as how to manage them. It also includes two case studies written by pilot hospitals in Argentina. During the first quarter of 2014, an international version of this document will also be published in English and in Spanish; it will include lessons learned as well as tools for hospitals developed as part of the work with the Philippines pilot hospitals.

The first version of this Guide was published in November 2013 and it was widely distributed during the final project workshop in November. A new and updated version is now available at HCWH's website as well as attached to this report.

2 -- Build Buy-In

HCWH invited two hospitals already members of its Global Green and Healthy Hospitals Network, to work with us as pilot hospitals for chemical substitution and safe management as part of this project. Both hospitals had showed interest in addressing chemical management problems in their respective facilities.

In Rosario City, the interest on the project was so big that the entire city health system decided to be part of it.

Between October 2012 and February 2013, we did a diagnosis of the situation at the point of start of the project and identified priority hazardous chemicals that could be substituted (the market and availability of alternatives was subjected for research during the first six months of the project as well). During those months and the diagnostic period, we worked with the groups to get buy-in from relevant units involved in the use and potential substitution and/or safe chemicals management (neonatology, laboratory, pathology, etc.). At every visit, we identified staff members willing to take part in the chemicals working group.

At the same time, we held meetings and visits to other hospitals in the country with some experience on safer chemicals management. We visited Hospital Austral, Hospital Italiano and Hospital Aleman, all three based in the Buenos Aires metropolitan area.

We had meetings with hospital members and authorities to present them the goals of this project and in April 2013, the first MOU was signed, between HCWH and Secretary of Health of Rosario City, Santa Fe Province. The Hospital Roque Sáenz Peña belongs to this municipal system and has more than ten years working with HCWH on mercury substitution, waste management and leadership. It is a member of the Global Green and Healthy Hospitals Network. The hospital counts on a group of committed professionals that immediately agreed to be part of the chemicals

working group. The invitation to take part in the working groups was made during the first workshop, held in Hospital Roque Sáenz Peña, the same day the MOU was signed. Staff from other municipal hospitals also attended the workshop, and showed interest in becoming part of the other chemicals working group that was going to meet at the Secretary of Health. Two chemicals working groups were formed: one in Hospital Roque Sáenz Peña and one for the rest of the system. The working groups had representatives from all relevant areas of the hospitals, especially those dealing directly with hazardous chemicals on a daily basis.

In September 2013, both groups and HCWH organized a second workshop, held in the Health Secretariat of the six public hospitals that make up the Rosario system. More than 60 people attended, and both groups exposed about their work in the chemicals working groups, and HCWH about chemicals risks in hospitals and available alternatives. The workshop included an activity to identify cleaning and disinfecting practices developed by HCWH and the chemicals working group that was included in the toolkit.

The MOU with Hospital Rivadavia, from Buenos Aires City, was signed in June 2013, due to change of authorities, which slowed down the process. This hospital is a founding member of the Global Green and Healthy Hospitals Network, but up until the project started, it did not count on a group of professionals working on waste management or safe chemicals management on a regular basis. Shortly after the first visit to the hospital, a working group was formed with staff from the laboratory, pathology area, surgery, pharmacy, nursing and neonatology.

The first training workshop at Hospital Rivadavia was held in September 2013 and was attended by staff from every unit. In 2014, a second workshop will be held and all 33 hospitals in Buenos Aires health care system will be invited, with the objective to work together on chemicals substitution and safe management.

Laboratories and pharmacies of the hospitals of Buenos Aires City operate as a network, so their decision to substitute hazardous chemicals has the potential to be expanded to other 33 hospitals that the city runs. This opportunity will be explored during 2014.

In all cases, the use of a check list document that HCWH developed was key to get buy-in from staff. The document was used to gather the information on where the chemicals were used and or stored in the facility. While doing this, staff felt the need and the interest to get involved in improving working conditions as well as reducing chemical risks.

3 -- Gather and Assess Data

a. Research environmentally preferable alternatives

During the first six months of the project's execution, HCWH carried out research to learn which were the safer products available for health care use in the country. The research was mainly on xylene, glutaraldehyde, cleaners, and ethylene oxide. During this period, first visits to selected hospitals were made to identify which hazardous chemicals were most frequently used.

As per xylene, for example, we arrived to the conclusion that there is no reliable information on the safety of xylene alternatives and that this is something that needs further research and follow up.

There are several products and practices that allow health care sector to substitute them or minimize them right away, including glutaraldehyde, ethylene oxide, some DEHP containing PVC products, Bisphenol A, chlorine, and other chemicals of concern as brominated flame retardants.

We used databases available from other NGOs, universities and governmental programmes as Design for the Environment from the Environmental Protection Agency (EPA) of the United States, to identify safer chemicals and

products already available for health care use.

We also held meetings with suppliers of these alternatives, and analysed the characteristics of the products publicized as safer or greener, interviewed health professionals that already used alternatives, etc. The information we came up with was also included in the toolkit document attached to this report.

b. Develop environmentally preferable chemical plans

After doing the first visits to the pilot hospitals and developing the chemical inventories, HCWH prepared specific proposals that were reviewed by the hospitals. The Environmentally Preferable Plans were developed after making sound diagnosis at each hospital and researching the alternatives available as well as discussing with the working groups.

Both pilot hospitals and the system in Rosario committed to work on reducing chemicals risks, and they have plans to keep on substituting hazardous chemicals where possible, as well as improving management practices. Their priorities are different depending on the opportunities, resources, availability of alternatives, and other programs.

In Rosario, during the project, meetings were held monthly, with the two groups up until November, and will continue through 2014, with the participation and technical assistance of HCWH. The groups decided to start working on X-Ray digitalization, minimization of the use of ethylene oxide, safe management of hazardous chemicals and substitution of phthalates containing PVC products and Bisphenol A. Hospital Roque Sáenz Peña had already started to substitute DEHP and Bisphenol A, and continued their substitution in Neonatology. This experience was then used by the children's hospital of Rosario, whose infection control nurse participated in the working group convened by the Secretary of Health. For 2014, the work on the selected areas will continue, and new goals have already been set on pharmaceuticals and anesthetic gases.

The working group convened in the Hospital Rivadavia and HCWH carried out research on ethylene oxide substitution given it was identified as a priority for surgical assistants, and although it wasn't possible to purchase the necessary equipment in 2013, the work will continue to achieve this objective in 2014. Hospital purchases of some products as high level disinfectants are made on a centralized basis for Buenos Aires City government system once a year so an agreement among infection control nurses, pharmacy and surgical assistants made it possible for glutaraldehyde to be removed from the list of products that can be bought. It will then be substituted from 2014 with a safer alternative. The hospital will also be replacing the use of chlorine in Neonatology and Pediatrics units, as a pilot experience. If the experience has positive outcomes, it will be expanded to the rest of the hospital.

4 -- Test the Model in Two Pilot Hospitals

While compiling information for the toolkit, we developed different tools that were used by the hospitals and that contributed to improve the model.

The model that we tested included the following six steps:

- Step 1:** Create a multidisciplinary working group to lead change on-site.
- Step 2:** Formally adhere to the gradual phase-out of hazardous chemicals as a facility-wide commitment.
- Step 3:** Evaluate and identify all hazardous chemicals used in the facility.
- Step 4:** Adopt policies that align with the gradual phase-out process.
- Step 5:** Launch a program for the actual phasing-out and safe handling of harmful chemicals.
- Step 6:** Document progress achieved towards reducing hazardous chemicals usage and assess the overall plan.

In Argentina, after creating an inventory with the assistance of HCWH, each hospital decided which chemicals were going to be prioritized for its substitution. After several meetings held by the chemicals working groups, where its members selected safer alternatives and analyzed the availability of those alternatives, decisions were made. The final purpose was to seek for the commitment of the involved medical services in order to conduct the substitution and sustain that decision throughout the coming years.

Due to administrative organization and purchasing policies, it was possible to continue the substitution of products with PVC in Neonatology services of both pilot hospitals. The substitution of new chemicals will be practiced in 2014 in both facilities, as explained above. Hospital Roque Sáenz Peña was able to change its contract with a sterilization company, which sterilized thermosensitive materials only with ethylene oxide, and started sterilizing some products with oxygen peroxide.

Both pilot hospitals are working on the substitution or minimization of ethylene oxide and establishing protocols to prioritize the purchase of materials that can be sterilized with autoclaves. Hospital Roque Sáenz Peña will also start working on Integrated Pest Management, implemented until today by an external company with no intervention of the chemicals working group. Hospital Rivadavia is starting in 2014 to replace chlorine.

HCWH will continue to work with both chemicals working groups to support new substitutions and to make sure that changes are sustained and expanded through the coming years.

5 -- Educate Stakeholders Throughout the Project

a. Dissemination of publication and other information education materials

Most of the materials developed during the project were compiled into the toolkit (the Guide

to Phasing-Out Hazardous Chemicals in the Health Care Sector). As mentioned above, this document was published during the November workshop and has since been available through HCWH's website.

Some of the professionals participating in the chemicals working groups belong to professional associations. There are plans to continue dissemination of this work through other networks.

As a complement of the work implemented in the two pilot hospitals, HCWH organized a webinar in July, where 45 people from different hospitals of Latin America participated and learned about chemical risks in health care facilities. In June as well, HCWH participated in the 1st International Congress on Social and Environmental Health held in the Rosario, where more than 200 people attended its presentation on chemical substitution and safe management of chemicals in the health care sector.

HCWH will offer a new webinar for Latin American health care workers, NGOs and government officials during 2014 to present the toolkit to a wider audience.

More information on workshops is given in point c of this section.

b. Create training materials in English

HCWH developed a toolkit called "Guide to Phasing-Out Hazardous Chemicals in the Health Care Sector" in Spanish. The Guide includes 6 steps to implement a Chemicals Substitution and Safe Handling plan, as well as examples and tools to implement each proposed step. Case studies were included, written by pilot hospitals. An international version of this tool kit will be published in English and Spanish in early 2014.

c. Train hospital staff and other stakeholders

As explained above, HCWH held several seminars (inception sessions, lectures),

workshops, and a webinar. One workshop was held at each hospital and at the Secretary of Health in Rosario, where staff from hospitals were trained on chemical risks.

In addition to that, every meeting with the three chemicals working groups worked as informal training sessions and skill sharing meetings. Approximately ten of those were held with each group. Each meeting had a program and it usually included a walkthrough in a hospital unit to talk about specific issues.

HCWH sent information and guidelines to all participants after the meetings, and participated in developing documents, for example, a purchasing policy for cleaners for Hospital Roque Sáenz Peña in Rosario.

As a formal closure of the project, we held a regional workshop on chemical substitution and safe management in November 2013 in Buenos Aires. The workshop was attended by health care workers, government officials and organizations from Argentina, Chile, Uruguay, Brazil, Peru, Colombia, Costa Rica, and Guatemala.

During the project, more than 450 people received direct training and several others had access to the tools through the internet.

C | Elements of the Project Not Implemented

The QSP Chemicals Substitution and Management in the Health Care Sector was implemented in 18 months instead of 24 months as it was originally planned. Due to this fact and that the funds provided to HCWH for this project were less than the amount requested, some of the goals were either modified or not completely achieved.

- Webinars. The proposal included a total of three webinars. One webinar was organized by HCWH Latin America, with 45 assistants from different countries and hospitals of the region. At least one more is planned for 2014 to present the toolkit.

- Create and distribute training and educational materials. HCWH Latin America developed training and educational materials that are freely available on its website and distributed 200 printed copies of the Guide to Phasing-Out Hazardous Chemicals in the Health Care Sector, during the Latin American Workshop held at the end of the project. Other hard copies were not done in significant quantities due to funding issues. However, every tool is available through the internet. And everything will soon be available both in English and in Spanish.
- Creating a Matrix of Health Care Priority Chemicals. As explained before, HCWH developed a toolkit that includes the information that is going to be further simplified on a matrix format which we published in the first semester of 2014. It will include hazardous chemicals, available alternatives, suppliers and basic recommendations for safe handling.

D | Next Steps and Sustainability of the Project

The work is going to continue and HCWH will expand and consolidate efforts to phase out hazardous chemicals in the health care sector.

As indicated above, the pilot hospitals plan to continue their efforts to substitute chemicals, expanding the number of chemicals addressed, and deepening their work on chemicals focused on in this project.

The tools and resources developed during the project will be distributed through HCWH's Global Green and Healthy Hospitals (GGHH) Network in order to expand chemical substitution work to other hospitals committed to sustainability issues. Members of this network are comprised of institutions representing the interests of more than 5,000 hospitals on every continent. Key staffs from pilot hospitals are an active part of the network and will be available to exchange information and experience with other interested hospitals.

The toolkit is already available in Spanish and is free for downloading at HCWH Latin America website.

A | Summary of Accomplishments

Main accomplishments of the project in the Philippines include:

- Two tertiary level private and public hospitals have participated in the project and will work on developing a more comprehensive chemicals management program.
- Two tertiary hospitals expressed interest in substituting glutaraldehyde and sodium hypochlorite in 2014.
- Twenty-four partner hospitals have started a comprehensive chemicals inventory in 2013 and committed to identify chemicals for substitution and management for 2014.
- Development and implementation of preliminary Laboratory Test Protocols to test efficacy of existing chemicals used in the hospitals and of the proposed alternatives.
- The National Reference Laboratory under the Philippine Department of Health actively worked on the validation of the Initial Test Protocol.
- Compilation of international and national policies on chemicals, together with corresponding chemicals matrix, made available to health care stakeholders and other interested networks via the world wide web.
- Conducted market research of alternatives and networking with alternatives distributors.
- Tool for inventory of chemicals developed and used in hospitals aided in identifying priority chemicals for substitution.
- Information on hazardous effects of chemicals in health care and use of alternatives have been provided to the two stakeholders.
- Stakeholders have gained knowledge in drafting their own Environmentally Preferable Chemicals Plans.
- Development and actual training of the module on “Chemical Safety, Substitution and Management Training for Health Workers” with participants coming from various third and fourth level hospitals from the National Capital Region and selected provinces.
- Conducted a Chemicals Safety Conference in October 2013 attended by various health care facilities, health care systems, professional organization, civil society and government agencies.

B | Details of Activities Conducted**1 -- Create a Health Care Priority Chemicals Matrix**

A list of international covenants and a matrix of priority chemicals were developed during the second half of 2012. There were five international covenants recognized which focused on identifying major chemicals of concern ranging from chemicals used in the production, manufacturing, agriculture and health industries. Twenty-three Philippine policies and circulars were listed which mainly discussed the control, regulation, transport and storage of chemicals in the different industries.

Most of the national policies related to chemicals were developed by the Department of Health and the Department of Environment and Natural Resources. The list of policies is an important tool in providing the necessary information on the use and regulation of hazardous chemicals for the different stakeholders. Electronic copies of international covenants and national policies will be made available at Health Care Without Harm’s website.

The chemicals matrix is a useful reference tool for the pilot hospitals to start their chemicals inventory and identify priority chemicals for immediate substitution; it will be constantly updated upon the availability of relevant information based on international and local researches.

2 -- Build Buy-In

During meetings and conferences sponsored by health professional organizations, associations, companies, civil society groups and government agencies, HCWH ensured that the concept and objectives of the Chemicals Substitution and Management project are shared and discussed to different stakeholders and key players in the health care industry. The hazardous effects of existing chemical disinfectants being used in the health care facilities and the health risks posed to health workers and its effects to the environment

are highlighted and the importance of using safer alternatives was emphasized. The strategy employed was broad stakeholder buy-in.

The selections of hospitals were based on two different types of management (private and public), geographical location and accessibility of products and services. After conducting several consultations and meetings with its partner hospitals and other stakeholders, HCWH was able to identify two tertiary hospitals – one from a landlocked city hospital, and the other an island setting hospital.

St. Paul Hospital from Tuguegarao City, Cagayan and Romblon Provincial Hospital from Odiongan Romblon were selected as pilot hospitals, representing different aspects of management, resources, types of facilities, manpower as well as types of health care services being offered by both facilities, thus, providing a cross section of the health care system and health care situation in the Philippines.

Health Care Without Harm-Southeast Asia (HCWH SEA) forged partnership with St. Paul Hospital Tuguegarao and Romblon Provincial Hospital to become the pilot hospitals. Key personnel of their respective institutions signed a Memorandum of Agreement (MOA). The MOA signifies commitment between HCWH SEA and the two hospitals to implement the project and ensure its sustainability after project completion.

During the preliminary walk through, the members of the Chemicals Management Team were identified in St. Paul Hospital Tuguegarao and Romblon Provincial Hospital. Both teams were able to identify their duties and responsibilities and develop program for Chemicals Safety, Substitution and Management for their respective hospitals. They also committed to evaluate alternatives and substitute hazardous chemicals with safer alternatives.

HCWH is continuously networking and coordinating with both health care facilities

to continue the work on substituting chemicals and empowering facilities in using tools to test chemicals for its efficacy and safety.

3 -- Gather and Assess Data

Preliminary walk through for the two pilot hospitals in the Philippines was conducted in August 2012 with the assistance of HCWH's consultant. Major areas of the hospitals like the Operating Room, Delivery Room, Emergency Room, Patient Wards, Nurse Stations, Central Sterile and Supply Room, Dental Room, X-Ray Room, Laboratory, Housekeeping, and Linen Departments were inspected and direct interview on the staff on-duty was conducted in order to have a general understanding on how the project would be implemented and how substitution should take place. The preliminary walk through gave a clearer view of how the model hospitals had been using chemicals and how they were managed. It is an important process to be able to identify priority chemicals for substitution.

Tool for the initial inventory of chemicals being used in the pilot hospitals were developed. The inventory includes the following information: area, product type, product name, manufacturer, hospital uses, amount/consumption, and methods of disposal. HCWH had a sense of how each hospital uses and manages their hazardous chemicals from the process of procurement to the process of safe storage and disposal. Both hospitals had little or no understanding on chemical policies regarding substitution of hazardous chemicals.

Based on the chemicals data matrix, the two pilot hospitals often used sterilants and disinfectants that contain chemicals, which are hazardous and may cause health risks to the health workers. Glutaraldehyde was used in sterilizing medical/ surgical instruments for both hospitals. Glutaraldehyde is a skin irritant and a carcinogen as well.

Both hospitals use sodium hypochlorite on floors, surfaces and other medical supplies as cleaning and disinfecting agents. Sodium hypochlorite liberates chlorine gas, which is a respiratory and skin irritant.

Most of the medical supplies i.e. tubings, suction sets, catheters, etc. contain PVC, DEHP, BPA and were sterilized using ethylene oxide gas which is a known carcinogen.

Copies of the initial inventory were given to both pilot hospitals to serve as reference for the hospital administration and Chemicals Management Team on what priority chemicals should immediately be substituted.

Two batches of focus group discussion (FGD) were conducted for both pilot hospitals. The FGDs aim to gather first-hand information from representatives of the different departments and sections of the hospital in order to obtain varied responses from the observations and experiences of the staff on issues related to infection control, the use and management of chemicals, health care waste management and education. Awareness on hospital policies and its implementation were also tackled during the sessions.

The FGD was conducted to assess the hospital staffs' knowledge and familiarity on related hospital procedures and to encourage participation in the implementation of the project.

a. Research environmentally preferable alternatives

HCWH's consultant assisted in the identification of preferable alternatives to chemicals based on the criteria set for safer chemicals and acceptable standards set by WHO and other related agencies. Alternatives to glutaraldehyde and sodium hypochlorite were identified since this is widely used as sterilant in hospitals in the Philippines.

Initial market research was conducted in conjunction with the consultation with the distributors of safer alternatives. There have been several meetings held with distributors of chosen chemicals for substitution. An initial list of distributors was submitted. At first, HCWH encountered some difficulty in identifying appropriate distributors since the concerned government agency (Department of Health) does not have a specific listing with regards to the chemicals that became the focus of

this project. The objective of this market research was to gather more information that would be beneficial to all other health care facilities since there is very little information available in any related government agency.

The market research helped in identifying more alternatives and their corresponding manufacturers or distributors. The result of the initial market research gave the campaign a better picture of which alternatives are appropriate to be included in the substitution plans. In consultation with the experts, HCWH has identified priority chemicals specifically sterilants and disinfectants which can already be considered by the pilot hospitals as well as other health care facilities to be included in their chemical substitution plans.

b. Develop environmentally preferable chemical plans

Meetings with the pilot hospitals were conducted to schedule product demonstration from two to three manufacturers/distributors of safer alternatives to chemicals specifically alternatives to glutaraldehyde and sodium hypochlorite. The pilot hospitals have different approach in terms of sourcing and purchasing of chemicals to be used in their facilities, an important concern that should be considered by HCWH in finalizing the list for substitution plans.

HCWH has assisted the pilot hospitals through trainings and lectures for the new rules and procedures in case of chemical spills, storage, management, etc. HCWH also provided one-on-one consultation with the pilot hospitals for concerns on chemical safety, substitution and management. Related policies and procedures were also developed during the training.

4 -- Test the Model in Two Pilot Hospitals

Laboratory test protocols were developed for the two hospitals to use as tools for initially testing the efficacy of their current chemical disinfectants and sterilants and the proposed safer alternatives. Initial

results were gathered and further testing shall be required to further check the effectiveness of the disinfectants and sterilants.

The laboratory protocols developed are initial protocols which can be improved by the hospitals based on their experience and practice. Its objective is also to supplement the infection control protocol as well as the purchasing requirements for chemical products used in the hospitals and to have a more uniform and consistent system in testing disinfection requirements of the pilot hospitals.

The protocols can already be recommended to other health care facilities depending on the resources and testing capacity of their respective laboratories. It can be modified according to the available resources of the hospital that are willing to implement the chemical substitution and management project.

Disinfectants and sterilants of choice by the two pilot hospitals were included in the testing together with possible alternative products that are non-glutaraldehyde and non-sodium hypochlorite that have undergone international testing standards.

HCWH also included the testing of coconut vinegar and commercial vinegar that were being used by both pilot hospitals as surface disinfectants in the offices and non-critical areas of the hospital.

Testing of both existing chemicals used and of the alternatives was conducted. Results have given both hospitals clearer understanding of the viability of the alternatives and have moved to continue testing more alternatives. They have also expressed substituting both glutaraldehyde and sodium hypochlorite in 2014, as further tests of alternatives are conducted.

The laboratory test protocol is one of its kinds to many health care facilities in the Philippines; it could standardize hospital laboratory procedures in terms of the appropriate use of disinfectants and cleaning agents.

Initial cost analysis was done by the pilot hospitals for this period through cost comparison between their disinfectants and sterilants of choice and the proposed safer alternatives. Cost analysis and documentation of practices on chemical substitution and management were part of the tasks identified for the pilot hospitals.

Linkage with the National Reference Laboratory of the Philippine Department of Health was established to conduct further testing. The National Reference Laboratory expressed willingness to participate in the review and standardization of the laboratory protocol for chemical substitution and management in 2014 for possible scale up of the project in the future.

5 -- Educate Stakeholders Throughout the Project

Inception sessions and lectures on “Understanding Chemicals and its Hazards” were conducted in 2013 with a total of 500 participants who attended the lecture sessions in different venues. Vital information on chemicals were shared to the participants and level of awareness were raised which prompted the health care facilities, health care institutions, health professionals and other health care workers to choose safer alternatives to their existing chemical disinfectants and sterilants.

Lectures and product demonstration from manufacturers and distributors of safer alternatives were also conducted during the first half of 2013. Aside from raising the awareness of the hospital staff and other health care professionals, the lectures and demonstrations helped and encouraged the participants in their decision to go for safer alternatives. The hospital management, infection control committee, waste management committee and newly established Chemicals Management Team, were also informed on the effectiveness of the disinfectants through the scientific studies presented by the manufacturers and distributors.

a. Dissemination of publication and other information education materials

Most publications and information materials that were distributed were based on HCWH's extensive chemicals work more specifically in the United States and Europe. One publication, the guide entitled, "Guide to Choosing Safer Products and Chemicals", was distributed to the pilot hospitals, and was also distributed to other partner hospitals, civil society organizations working on health issues, pilot hospitals, health professional organizations/associations and health professionals/ health care workers.

HCWH also attended seminars, forums and conferences where this publication was distributed.

HCWH Argentina has published a guide to phasing-out hazardous chemicals in the health care sector in Spanish and is in the process of translation. Translation will be completed within the first quarter of 2014, and will be ready for distribution to all health care stakeholders and interested individuals and groups in the Philippines.

b. Create training materials in English

In July 2013, HCWH developed a short training course on "Chemical Substitution, Safety and Management Training for Healthcare Workers" which contains nine (9) modules on the following topics:

- 1 Formation of Chemical Safety and Management Committee
- 2 Documentation and Identification of Existing Health Care Wastes
- 3 Policies and Regulations Related to Chemical Safety and Substitution
- 4 Understanding Chemicals and its Hazardous Effects
- 5 Chemical Safety, Management and Substitution
- 6 Handling, Transport and Disposal of Chemicals in Health Care
- 7 Personnel Safety and the Use of Appropriate Personal Protective Equipment

- 8 Prevention of Chemical Hazards and Management of Spills
- 9 Plan of Action

The training modules were used during the National Workshop on Chemicals Safety, Substitution and Management on September 18-19, 2013.

The first three (3) modules focused on the internal system of the health care facility which included policies on waste management and infection control, presence of chemical safety and management committee and documentation and identification of existing health care wastes in order to draw up baseline data.

The next five (5) modules focused more on chemicals and its use, handling, storage, transport, and disposal; use of material safety data sheet; proper use of personal protective equipment and management of chemical spills.

The last module focused on developing the plan of action of the health care facility and how the chemical substitution and management project shall be implemented.

c. Train hospital staff and other stakeholders

During the first half of 2013, HCWH organized a forum on "Understanding Hospital Chemical Hazards" attended by more than 50 healthcare workers. Another forum on "Substituting Hazardous Chemicals in the Health Care Setting" was organized, and had the President of the Philippine Society of Endoscopy Nurses and Assistants as main speaker.

HCWH also launched the first National Workshop on Chemicals Safety Substitution and Management held on September 18-19, 2013. Around 70 participants attended the training and participated in the workshop. Most of the participants are doctors, nurses, medical technologists, engineers and housekeeping staff who are also members of

the health care waste management committee, infection control committee and/or pollution control committee of their respective facilities.

The following are the recommendations of the participants during the said workshop:

For Health Care Facilities:

- 1 Formulation of a Chemicals Management Committee (CMC) and align their functions and responsibilities with the existing committees like Health Care Waste Management, Infection Control and/or Pollution Control.
- 2 Implement plans for chemicals safety and management as developed from their group workshops. Immediate activities are:
 - a. Inventory of chemicals
 - b. Review and revise chemicals storage and disposal procedures
 - c. Draft guideline and standard operating procedures following the material safety data sheets (MSDS) per chemical and Globally Harmonized System (GHS); and
 - d. Integrate “green procurement” to purchasing policies.
- 3 Institutional-wide support for Chemicals Management Committee (CMC)—management to support plans and programs of CMC and, all hospital personnel for compliance and cooperation.
- 4 Trainings to update and/ or enhance knowledge and skills of health care workers on chemical safety and management
- 5 Identify best practices of other hospitals and be open for benchmarking

For Government Agencies:

- 1 Department of Environment and Natural Resources (DENR): Follow-up on the central storage of phased-out mercury devices.

- 2 Department of Health: Through PhilHealth, submission of chemicals management plans and availability of material safety data sheets (MSDS) of hospital chemicals as licensing and renewal requirements for hospitals.
- 3 Testing standards on the efficacy of chemical products including safety evaluation for end users, general public, and the environment.
- 4 Inter-agency cooperation on information dissemination and compliance monitoring to Globally Harmonized System (GHS) labeling of chemical products.
- 5 Review laws on chemicals and draft implementing rules and regulations (IRR) for strict compliance of manufacturers and distributors.
- 6 Trainings on chemicals management including risk assessment.

All of the recommendations were documented and were presented during the Chemical Safety Conference held in October 2013.

C | Elements of the Project Not Implemented

HCWH-SEA was not able to fully satisfy the other elements of the project objectives specifically items “G. Exploring control banding for worker safety and H. Analyse positive and negative financial impacts of chemical substitution and management”.

We have not developed a recommended control banding tool for hazardous health care chemicals given that the Philippine government itself have not yet come out with a comprehensive list of chemicals with control banding systems. However, control banding as a topic was given emphasis in the developed training module on chemicals safety and management.

The thorough cost analysis translated in monetary terms for chemical substitution and management was left to the discretion of both pilot hospitals in

respect of their financial and purchasing policies. Also, given the procedural activities for actual substitution of chemical products, this would entail considerable period of time to measure its financial implications to patient, healthcare workers, and the environment.

D | Next Steps and Sustainability of the Project

With the assistance of HCWH, the pilot hospitals were equipped with new information, policies and systems on chemical substitution, safety and management. The introduction of a laboratory test protocol has empowered the pilot hospitals in identifying and testing alternatives that would suit their facility, it also has given them a more active role in choosing chemicals to be used in the future.

The establishment of a Chemicals Management Team (CMT) and convening them is already a big step for the pilot hospitals. The CMT shows that there is a committed group who will lead and implement the programs and plans on chemical safety and management. The priority list of chemicals for substitution identified during the inventory will be the basis for further study for costing, efficacy and safety testing of the pilot hospitals.

Documentation of the practices on chemical safety, substitution and management shall serve as evidence-based to forward the advocacy for choosing safer alternatives to chemical disinfectants and sterilants and shall ensure sustainability of the project.

Health care facilities should also invest on providing education and training to the hospital staff to increase their awareness on chemical safety and encourage support and participation for the implementation of the project.

Networking and linking with health care institutions, government agencies most significantly with National Reference Laboratory (attached agency of Department of Health), Occupational Safety and Health Center (attached

agency of Department of Labor), Philippine Hospital Association, and Philippine Hospital Infection Society, civil society organizations, and academe is an important and effective strategy to ensure build and buy-in of the project.

The following are the perceived challenges for the project:

For Policy Development:

- 1 Inclusion of hazardous health care chemicals in priority chemical list and/or issuance of Chemical Control Order.
- 2 Drafting of national laws, administrative orders, and department memoranda with stricter guidelines on chemical use, handling, transport, treatment and disposal.

For Project Replication:

- 1 More hospitals to buy-in to the project as another batch of pilot models
- 2 Partnership with government agencies and other stakeholders to support project components and activities;
 - a. Database of hospital chemicals
 - b. Market research for safer alternatives
 - c. Test standardization for chemical products; and
 - d. Training of health care workers and other stakeholders
- 3 In collaboration with the Department of Health's National Reference Laboratory, develop a standardized laboratory protocol for National Testing Mechanism to determine the efficacy of the safer alternative products, provide product certification and provide further performance evaluation.

Annexes

Argentina

1. Comparative table of chemicals of concern found at each hospital visited
2. Report Hospital Austral visit
3. Report of first and second meetings at Hospital Roque Saenz Peña
4. Report of first meeting at Hospital Rivadavia
5. MOU Hospital Rivadavia Bueno Aires, Argentina
6. MOU Secretary of Health Rosario, Argentina
7. Program of 1st Workshop Hospital Rivadavia Buenos Aires, Argentina
8. Program of 1st Workshop Hospital Roque Sáenz Peña, Rosario
9. Program of 1st Workshop Secretary of Health Rosario, Argentina
10. Program of Final Projects Workshop
11. Guide to Phasing-Out Hazardous Chemicals in the Health Care Sector

Philippines

1. Initial List of Philippine Policies and Circulars on Chemicals
2. Initial List of Suppliers and Manufacturers for Possible Alternatives
3. Hospital Visit to St. Paul Hospital Tuguegarao
4. Hospital Visit to Romblon Provincial Hospital
5. Chemicals Data Sheet for St. Paul Hospital Tuguegarao
6. Chemicals Data Sheet for Romblon Provincial Hospital
7. Memorandum of Agreement with St. Paul Hospital Tuguegarao
8. Memorandum of Agreement with Romblon Provincial Hospital
9. Preliminary Hospital Report for St. Paul Hospital Tuguegarao
10. Preliminary Hospital Report for Romblon Provincial Hospital
11. Laboratory Test Protocol for Chemicals Substitution
12. Laboratory Test Protocol for Chemicals Substitution Using Known Bacteria
13. Training Course Outline on Chemicals Safety Substitution and Management for Health Workers
14. Training Syllabus on Chemicals Safety Substitution and Management for Health Workers
15. Green Hospitals and Chemical Safety Conference Program

ENDNOTES

¹World Health Organization, SAICM, "Strategy for strengthening the engagement of the health sector in the implementation of the Strategic Approach to International Chemicals Management", International Conference on Chemicals Management in Nairobi, Kenya, September 2012. http://www.who.int/ipcs/capacity_building/chemicals_management/saicm_iccm3_en.pdf

²World Health Organization, "Report by the Secretariat on Strategic Approach to International Chemicals Management", 63rd World Health Assembly, March 25, 2010. http://apps.who.int/gb/ebwha/pdf_files/WHA63/A63_21-en.pdf