



# MOBILIZING HEALTH CARE TO PREVENT PLASTIC POLLUTION: A PLASTICS TOOLKIT FOR HOSPITALS





# CONTENTS

1	<b>Table of Contents</b>
5	<b>Executive Summary</b>
6	<b>Healthcare's Role in Changing the Narrative on Plastic Pollution</b>
10	<b>Plastics, good and bad</b> <ul style="list-style-type: none"><li>Bio-based and “biodegradable” plastics</li><li>Plastics life cycle</li></ul>
18	<b>How to conduct a plastics audit</b> <ul style="list-style-type: none"><li>Step by step plastics audit</li></ul>
24	<b>Hospital Action</b>
24	Guidance on how to reduce plastics within healthcare <ul style="list-style-type: none"><li>Choose your target</li><li>Identify alternatives</li><li>Test alternatives</li><li>Make a policy decision</li><li>Implement the policy</li><li>Measure success</li><li>Follow up</li></ul>
27	Action points for each waste stream
28	Guidance on Strengthening Hospital Communications Capacity <ul style="list-style-type: none"><li>Be Informed</li><li>Research, Publish and Share Extensively</li><li>Use Creative Methods to Raise Awareness and Prescribe Solutions</li><li>Lead by example in the Hospital and the Community</li></ul>
30	<b>Policy Action for governments</b>
31	<b>Industry actions</b>
32	<b>Case studies on plastics in healthcare</b> <ul style="list-style-type: none"><li>Plastic Waste Audit Experiences in the Philippines and Indonesia<ul style="list-style-type: none"><li>Alabang Medical Clinic, Philippines</li><li>Mary Johnston Hospital, Philippines</li><li>St. Paul Hospital Cavite, Philippines</li><li>Universitas Gadjah Mada Academic Hospital, Indonesia</li></ul></li></ul>



Health Care Without Harm seeks to transform health care worldwide so the sector reduces its environmental footprint and becomes a leader in the global movement for environmental health and justice. It has three regional offices (based in Brussels, Manila, and Washington, DC) that develop regional work and initiatives in Latin America, Europe, South East Asia, and the United States, respectively; and strategic partners in Australia, Brazil, China, India, Nepal, and South Africa working on HCWH-related projects.

**HCWH in Southeast Asia** took root in 2003. It led the Philippine Measles Eradication Campaign in 2004 which demonstrated the possibility of conducting a major immunization campaign without incinerating the resulting waste. The campaign was then cited in international conferences. Now the SEA office implements campaigns and programs in Indonesia, Viet Nam, Thailand, Taiwan, South Korea and has partners in India, China and Nepal.



GGHH is an international network of hospitals, health care facilities, health systems, and health organizations dedicated to reducing their environmental footprint and promoting public and environmental health. The Global Green and Healthy Hospitals network has more than 1,185 members in 58 countries who represent the interests of over 36,000 hospitals and health centers.



This toolkit is made possible by the assistance from Plastic Solutions Fund.

-----  
*This toolkit is made possible by:*

*Alabang Medical Clinic  
Mary Johnston Hospital  
St. Paul Hospital Cavite  
Universitas Gadjah Mada University Hospital  
City Environment and Natural Resources Office, San Fernando Pampanga  
University of the Philippines - College of Public Health  
University of the Philippines - Philippine General Hospital  
Regional General Hospital (RSUD) R. Syamsudin, S. H.*

-----  
Ruth Stringer  
Ramon San Pascual, Moresa Tolibas-Reyes and Ma. Paz Oliva  
**Layout:** Kariza Cruz  
**Administrative Support:**  
Joyce Lanuza, Raphael Lopez, Nefri Mendinueto and Kris Evangelista

# ABBREVIATIONS

ABS	Acrylonitrile Butadiene Styrene
BFFP	Break Free From Plastics
BPA	Bisphenol - A
DEHP	Di-2-ethylhexyl phthalate
EPR	Extended Producer Responsibility
EU	European Union
GAIA	Global Alliance for Incinerators Alternative
GGHH	Global Green and Healthy Hospitals
HCWH	Health Care Without Harm
HCWM	Health Care Waste Management
HECAF	Health Care Foundation Nepal
IV	Intravenous
KMH	Kathmandu Model Hospital
LCA	Life Cycle Analysis
LDPE	Low Density Polyethylene
LGU	Local Government Unit
MJH	Mary Johnston Hospital
MOH	Ministry of Health
MRF	Materials Recovery Facility
NICU	Neonatal Intensive Care Unit
NHS	National Health Services
OPD	Outpatient Department
PETE	Polyethylene Terephthalate
PP	Polypropylene
PS	Polystyrene
PSF	Plastic Solution Fund
PVC	Polyvinyl Chloride
UGM	Universitas Gadjah Mada Academic Hospital
UK	United Kingdom
USA	United States of America

# GLOSSARY

## Acrylonitrile Butadiene Styrene

opaque, thermoplastic and amorphous polymer.

## Bio-based Plastics

plastics made in whole or partially in renewable biological resources.

## Bisphenol A

synthetic organic compound used to make plastic. An endocrine disruptor.

## Casein

protein-based polymer used to make bio-based plastic.

## Cellulose

organic-based polymer used to make bio-plastic.

## Dextrose

type of simple sugar where polylactic acid is derived.

## Extended Producer Responsibility

policy-strategy that directs the responsibility of manufacturing to disposal to product manufacturer/manufacturing sector.

## Macroplastic

relatively large plastic pieces that is often found within the marine environment.

## Materials Recovery Facility

area where wastes, particularly the recyclables are sorted into groups and stored.

## Microbeads

manufactured plastic particles. They are usually less than 1mm and found in various products such as facial wash.

## Microplastics

minute plastics debris from broken down plastic products.

## Monomers

basic unit of a polymer.

## Olefin Fabric

single-woven plastics to imitate fabrics. Used to medical gowns, masks, wet issues etc.

## Petro-Based Plastics

plastics manufactured from fossil fuels.

## Phthalate

mainly used as plasticizers, making plastics more malleable and flexible.

## Polylactic Acid

organic polymer derived from dextrose.

## Polymer

long chains of repeating molecules bonded together.

## Polyurethane

polymers joined by carbamates (urethane).

## Resin Identification Code

codes or symbols used to identify the type of polymer used in manufacturing the plastic.

## X-ray Fluorescence

non-invasive and non-destructive analytical analysis technique determining composition through emitted x-ray fluorescence.

## Zero Waste

generating little to no waste by implementing the principles of circular economy.



# EXECUTIVE SUMMARY



Plastics in Healthcare is an initiative by Health Care Without Harm South East Asia that mobilizes the network of Global Green and Healthy Hospitals (GGHH). Its intention is the reduction of single use plastic in hospital settings; upstream policy advocacy, engagement with suppliers to reduce plastic packaging in medical products, and replacement of hazardous plastic with safer alternatives. The other important component of healthcare intervention in plastic crisis is to articulate clearly the health impact of plastic from a life cycle perspective understanding various pathways by which human health is impacted by production, utilization and disposal of plastic.



This Toolkit is all about fighting plastic pollution in the healthcare setting. It reiterates the recommendations made in the earlier technical report, Plastics in Healthcare, Health Professionals as Advocates to Reduce Plastic Pollution. The Toolkit will aid in understanding and translating it into increased healthcare actions to reduce the harm caused by excessive plastic use in their facilities and strengthen healthcare professionals as advocates for national, regional and global action. **The toolkit will become the main material to teach hospitals how to address plastic pollution in their facilities.**



As a toolkit, it contains the following major elements: Information on life cycle hazards of different polymers, long term vision and short-term recommendations for action, how-to guide on the conduct of simplified plastics audit, guidance on how to reduce plastics within healthcare, outline of advocacy options within and beyond the healthcare sector, and compilation of available case studies on plastics from GGHH Network members both in Southeast Asia and beyond.



The sets of practical tools found here are meant to be applied on two key areas for hospitals to effectively deal with plastics pollution: first is how to conduct waste audits in healthcare facilities; and second is advocacy and engagement at two levels: policy inside the hospital, and policies that need promotion with the local or national governments. It also has a section on practical guidance and advice on how to deal with suppliers and manufacturers.



***Imagine hospitals confronting plastic pollution and working together for a healthier, more sustainable planet for the next generation.***



## HEALTHCARE'S ROLE IN CHANGING THE NARRATIVE ON **PLASTIC POLLUTION**

Plastics have an essential role in healthcare, in life-saving devices such as syringes and IV lines. However, like all other sectors and industries, healthcare is overusing plastic and needs to examine how it can reduce its consumption, and ensure that what it does use is safely and sustainably disposed of.

Healthcare professionals at all levels have an essential role in reducing the impact of the plastics that they use and dispose of. They can also be a role model for their local community and share lessons from their own experience to advise and inspire wider changes.

For instance, much effort in recent years has been devoted to improving recycling rates, but we can't recycle our way out of the plastics crisis. Only about 9% of plastics are recycled<sup>1</sup>, and many plastic products are not recyclable for technical and economic reasons. Instead, we have to reduce our consumption of plastics, starting with unnecessary products, items that cannot be recycled, and anything with a toxic additive or having a particularly hazardous lifecycle.

**More plastic doesn't always mean safer practices.** In the aim of keeping food safe, hospitals tend to cover food trays with plastic wrap and provide unnecessary food wares, that may contain phthalates and bisphenol A (BPA) which are known endocrine disruptors.





Plastic bottles are a thing of the past. Using stainless tumblers and reusable bottles has now become a necessity. [Hospitals can help by providing safe drinking water to patients, staff and visitors.](#) Not only it is safe but also prevents the consumption of single-use plastic bottles that trash the planet and harm our health.

Being aware of the dangers plastic can impact human and planetary health, [hospitals can decide to avoid products like plastic sachets that eventually show up in our communities, rivers, and oceans.](#)

*Considering their influential position in society, **healthcare professionals are some of the best messengers of the health impacts of plastics** and can greatly shape institutional and national policies. Not to mention, engage national manufacturers in improving their products — seek out, purchase and demand less waste, more recyclability, properly labelled, fewer toxics. Learn about the importance of the circular economy and share the message.*

[Make the voice of the healthcare sector heard.](#) Doctors, nurses, medical directors and procurement officers can speak at regional and international forums like the annual Our Oceans' Conference.

[Network and collaborate through the Global Green and Healthy Hospitals \(GGHH\) Network and the Sustainable Health in Procurement Project \(SHiPP\).](#) Being part of these initiatives, health professionals can connect with other hospitals in strengthening social, behavioral and institutional influence.

To bring these narratives of solutions to a wider audience, the [healthcare sector can lead alliances and advocacy groups and step up social and mass media engagement.](#)

This process had already started in the city of San Fernando, Pampanga Province, Philippines. HCWH and GAIA have worked with four hospitals, helping them conduct plastic waste audits. As a result, the City Environment and Natural Resources Office (CENRO) and Health Care Without Harm (HCWH) have discussed and planned to collaboratively review and develop policies and strategies, primarily, to improve hospital waste management, plastic use and disposal. Once developed, it will be implemented in hospitals under the jurisdiction of the Local Government Unit of San Fernando, Pampanga.

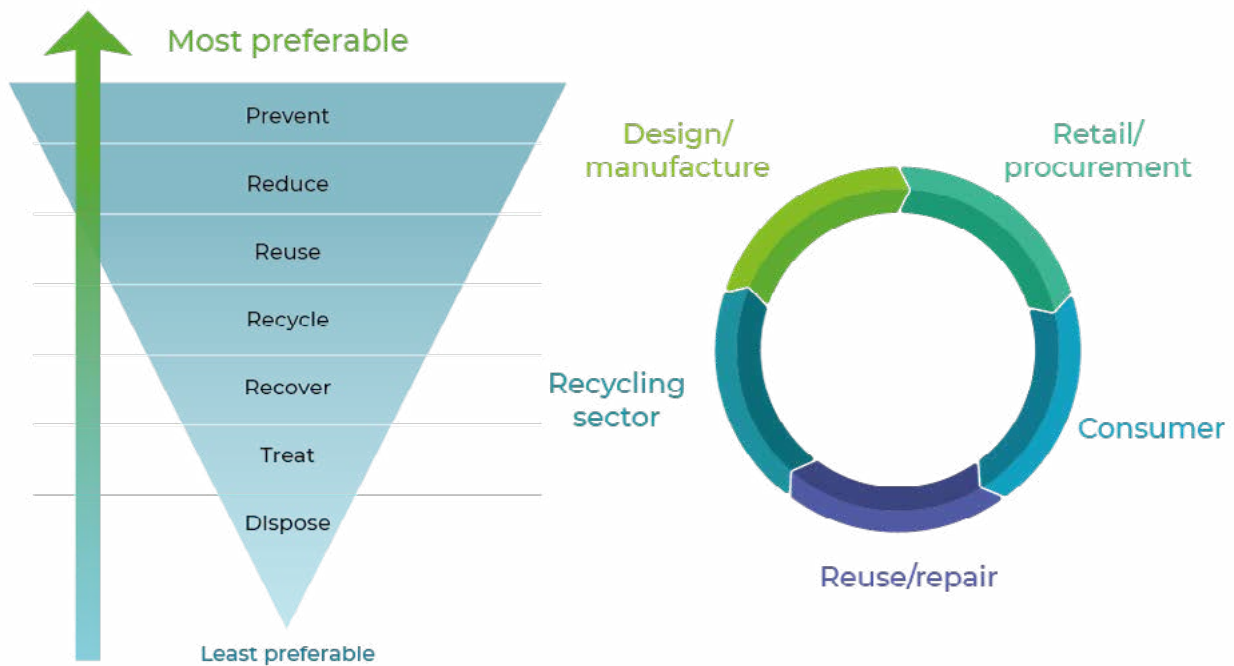
<sup>1</sup> Geyer et al. (2017) Production, use, and fate of all plastics ever made. Science Advances 3(7): e1700782, <http://advances.sciencemag.org/content/advances/3/7/e1700782.full.pdf>

# THE WASTE HIERARCHY AND THE CIRCULAR ECONOMY

The waste hierarchy is a familiar part of environmental thinking. It ranks ways to deal with waste, from the most to the least favoured. Eliminating waste is the first option, and landfilling and incineration the last resort.

The circular economy concept builds on this, expanding it to explicitly involve the whole product life and better design of products and systems. Contrary to the conventional “make, use, and dispose” linear economy model, the circular economy envisages the elimination of unnecessary products and toxic materials which not only risk human and environmental health, but hamper recycling and materials recovery<sup>2</sup>.

Products are designed to be reusable, repairable, and, once they have reached the end of their useful life, they are recyclable. Business models are built around long-term plans, collective responsibility through the value chain and extended producer responsibility<sup>3,4</sup>.



*Comparison of the waste hierarchy with the circular economy.*

<sup>2</sup> ChemSec (2019) The missing piece: Chemicals in Circular Economy. Publ: ChemSec, Gothenburg, Sweden, 15pp, [https://chemsec.org/app/uploads/2019/03/The-missing-piece\\_190313.pdf](https://chemsec.org/app/uploads/2019/03/The-missing-piece_190313.pdf)

<sup>3</sup> Ellen MacArthur Foundation and Fung Global Institute (2014) Towards a Circular Economy in Asia. ISSUES AND OPPORTUNITIES. 29pp, [http://www.asiaglobalinstitute.hku.hk/en/wp-content/uploads/2016/06/Circular-economy\\_tnv3.pdf](http://www.asiaglobalinstitute.hku.hk/en/wp-content/uploads/2016/06/Circular-economy_tnv3.pdf)

<sup>4</sup> ISWA (2017) Extended Producer Responsibility. Publ: ISWA, Vienna, 10pp, [https://www.iswa.org/index.php?eID=tx\\_iswaknowledgebase\\_download&documentUid=4202](https://www.iswa.org/index.php?eID=tx_iswaknowledgebase_download&documentUid=4202)



Image by Ton Crew

# PLASTICS, GOOD AND BAD



## PET/PET- Polyethylene terephthalate

This is most commonly used in water and drinks bottles and is recyclable. Life cycle hazards include toxicity from the monomers, impacts from extraction and energy consumption. Huge amounts of PET are used in unnecessary single use applications, including water and drinks bottles.



## HDPE- High density polyethylene

Polyethylene is one of the biggest production plastics. It is recyclable and has among the fewest toxicity hazards during the life cycle hazards as it is made simply from natural gas. However, extraction and processing of hydrocarbons has significant impacts, especially where it is extracted from sensitive ecological areas such as the arctic. Amongst many applications it is in milk bottles and IV fluids.



## PVC/V Polyvinyl chloride/vinyl

PVC is both one of the biggest bulk plastics and the most toxic plastic, with significant hazards in production, use and disposal. The basic building block, vinyl chloride, is a human carcinogen, and manufacturing can involve mercury and asbestos. Both the production and incineration of PVC generate large amounts of highly toxic dioxins and furans. Harmful additives are needed to turn it into usable products and, apart from window frames, is almost never recycled. It is also used in wiring guttering and IV lines.



<sup>5</sup> Wikipedia (2019) Resin identification code [https://en.wikipedia.org/wiki/Resin\\_identification\\_code](https://en.wikipedia.org/wiki/Resin_identification_code)

<sup>6</sup> Stringer et al. 2018 Plastics in health care. Publ: HCWH Asia, <https://drive.google.com/file/d/1Vz44Jj5agoE6BHRfq4JXJ63NU52n7-H/view>

<sup>7</sup> 4R Sustainability, Inc. (2011) Demingling the mix: An assessment of commercially available automated sorting technology. Second edition.

Identifying plastics by eye can be very hard to do. Some of the most widely used polymers can be identified by their resin identification code<sup>5</sup>. However, there are many polymers that don't have codes, and manufacturers may not label their products. HCWH found that very few medical devices in the Philippines and Indonesia were labelled<sup>6</sup>. In the absence of labelling, x-ray fluorescence may be used to identify polymers. This can be done with handheld units or automated in materials recovery facilities<sup>7</sup>.



#### LDPE Low-density polyethylene

Low-density polyethylene is chemically the same as high-density polyethylene, but is processed slightly differently to make a lighter and more flexible final product. Traditional plastic (polythene) bags are made of LDPE. It is cheap, comparatively non-toxic and recyclable, but few plastic bags are in reality recycled, because of their low value. Dispersed into the environment, they can have a huge impact when they are consumed by wildlife such as whales and turtles.



#### PP Polypropylene

Like polyethylene, polypropylene is a high production volume plastic with a comparatively low toxic impact from the life cycle, apart from the extraction and processing of fossil fuels from which all plastics are made. It can be recycled. It has many uses, including bottle caps and water pipes.



#### PS Polystyrene/styrofoam

Polystyrene can be used as a solid plastic in products such as CD cases, or expanded into a foam for products such as packing beads, insulation and fast food clamshells. Its monomer, styrene, is highly toxic and the products are not recycled.



#### Others

This category includes many types of plastics, including polycarbonate, which is made from the endocrine disruptor bisphenol A, and ABS (acrylonitrile butadiene styrene) which has a high impact resistance but is made from harmful monomer, and many other plastics, including novel and innovative polymers. This category cannot be recycled because of the mix of materials it contains.





## BIO-BASED AND “BIODEGRADABLE” PLASTICS

Bio-based plastics are also called bioplastics and biopolymers. There is a lot of confusion around these terms and it is widely assumed that they are biodegradable and environmentally preferable to those made from fossil fuels (petroleum-based plastics). In fact they may be neither.

Most bio-based plastics are made from types of sugar molecules, such as starch; on cellulose; proteins such as casein; or polylactic acid, which is derived from a type of sugar called dextrose. Although some may be made of waste plant material, others are made from edible feedstocks such as potato starch, or from crops that are grown specifically for making plastics. Hence there may be a conflict between using land for food or for plastics. When so many people suffer hunger and so many species are endangered by habitat loss, it is unsustainable to convert farming land or destroy natural ecosystems for plastic production.

Many bio-based plastics are biodegradable but may require the special conditions in industrial composting facilities, which local authorities can rarely provide. Supposedly biodegradable bags can in fact, still be intact enough to carry groceries after three years in the marine environment . It is also possible to use biomass to make conventional plastics like polyethylene and these are no more biodegradable than any other polyethylene.

Promoted as a biodegradable solution, oxo-degradable plastics are a hybrid, made from particles of petroleum-based plastics (typically polyethylene) held together with a biodegradable binder. When the binder degrades, the petroleum-based plastics are released as

microplastics. Plastics of this type can also adversely affect recycling and composting systems. Composting requires that materials not only break down but become a useable part of the compost. Instead, the plastic fragments will contaminate the compost <sup>9</sup>.

## Olefin fabrics

Artificial, petroleum-based fabrics of all types contribute to environmental microplastics contamination<sup>10</sup>.

Olefin fabrics are made from plastics like polyethylene and polypropylene. They are used for applications like wet wipes, “blue wrap” used to package sterile instruments for surgery, and disposable surgical gowns.

Olefin fabrics are recyclable where systems exist, but items like wet wipes are being flushed into the sewer, where they cause serious blockages. Disposable gowns are replacing reusable ones, swelling the load of unnecessary plastic products in the healthcare facilities.

## SECRET PLASTICS

Some products are not obviously plastic, but don't miss them out!

“Paper” cups and some packaging that looks like paper, are made of paper coated with plastic.

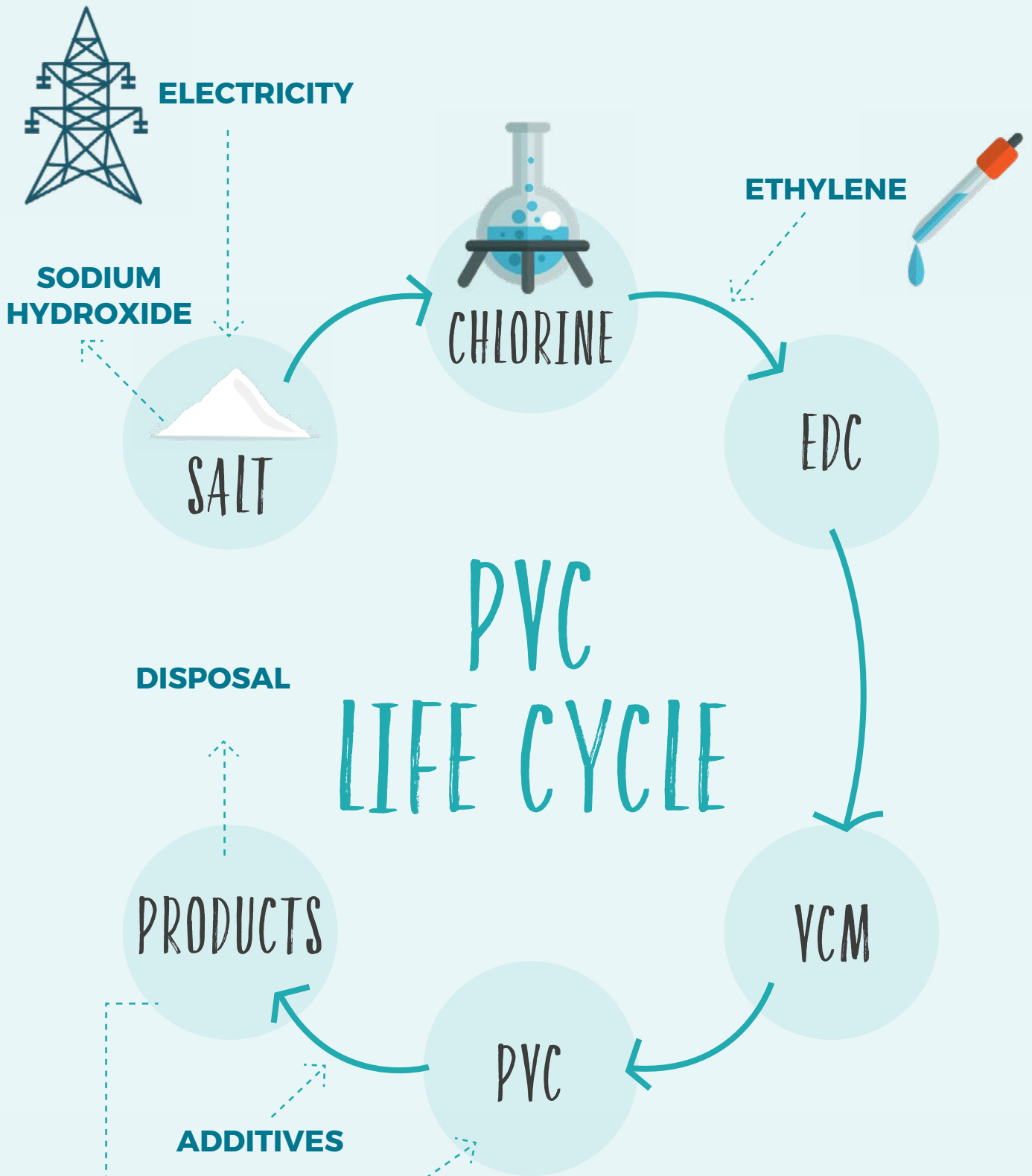
Surgical masks, caps, shoe covers, disposable surgical gowns, and wet wipes are all made of non-woven plastic fabric called “olefin fabrics”.



<sup>8</sup> National Geographic (2019) Biodegradable shopping bags buried for three years still work <https://www.nationalgeographic.com/environment/2019/04/biodegradable-shopping-bags-buried-for-three-years-dont-degrade/>

<sup>9</sup> EC (2018) REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the impact of the use of oxo-degradable plastic, including oxo-degradable plastic carrier bags, on the environment. COM(2018) 35 final, 9pp, <http://ec.europa.eu/environment/circular-economy/pdf/oxo-plastics.pdf>

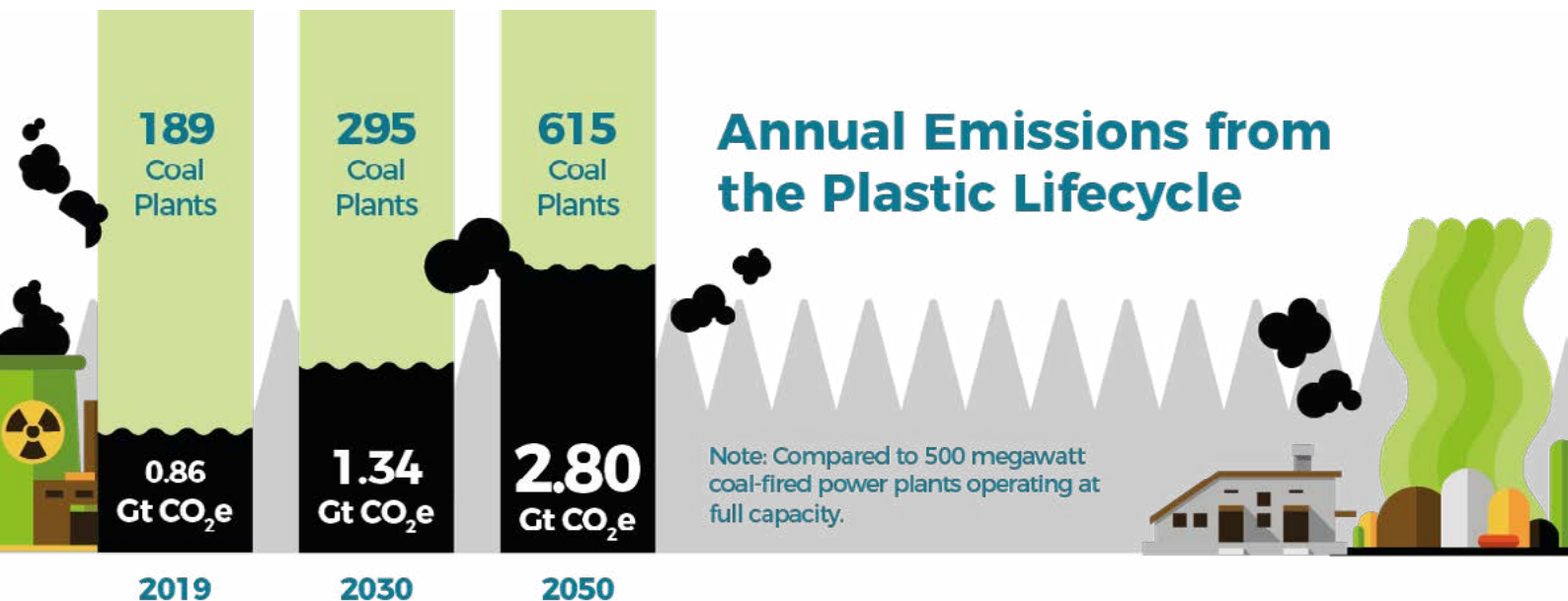
<sup>10</sup> Allen et al. (2019) Atmospheric transport and deposition of microplastics in a remote mountain catchment. Nature Geoscience 15 April 2019, <https://doi.org/10.1038/s41561-019-0335-5>



Schematic of the PVC life cycle

N.B. Much Chinese PVC is manufactured using the "acetylene process" with coal as the feedstock and mercuric chloride as catalyst.





*Plastic and Climate: The hidden costs of a plastic planet, CIEL Report*

*The plastics life cycle causes environmental and human harm at each stage<sup>11</sup>. The majority of plastics are made from fossil fuels-oil and coal. Oil predominates, but as much as 63% of Asian PVC production uses coal<sup>12</sup>. A much smaller amount of plastics are made from biological materials. Fossil fuel extraction encompasses drilling for oil, coal mining and fracking, each of which has huge environmental impacts, including contamination of ecosystems with oil and hazardous chemicals used in the extraction process.*

Processing these materials into polymer has multiple steps depending on the polymer, consumes more energy and involves many hazardous chemicals. For example, PVC is made from the monomer vinyl chloride, which is explosive and a known human carcinogen. Vinyl chloride itself requires chlorine, which is made by energy intensive processes using mercury, asbestos or membranes made from persistent organic pollutants. Residues from vinyl chloride manufacture contain hundreds of pollutants including high concentrations of dioxins and furans.

Turning polymers into products can require multiple additives, such as dyes, stabilisers and plasticisers. Many of these are toxic and can leach from the product during use. Monomers - the building blocks of plastic - can also leach out. This is particularly important in medical products, where they can impact the health of patients.

Bisphenol A is used in the production of polymers including polycarbonate and epoxy resins, and in the polymerisation of PVC and flame retardants.

<sup>11</sup> CIEL and partners (2019) Plastic and health: the hidden costs of a plastic planet. Publ: CIEL, Geneva, 84pp, <https://www.ciel.org/wp-content/uploads/2019/02/Plastic-and-Health-The-Hidden-Costs-of-a-Plastic-Planet-February-2019.pdf>

<sup>12</sup> Vallette (2019) Chlorine and Building Materials: A Global Inventory of Production Technologies and Markets. Phase 2: Asia. Including Worldwide Findings. Publ: Healthy Building Network, 112pp, <https://healthybuilding.net/reports/20-chlorine-building-materials-project-phase-2-asia-including-worldwide-findings>

<sup>13</sup> HCWH (2015) Non-toxic Healthcare: Alternatives to Phthalates and Bisphenol A in Medical Devices. Publ: Health Care Without Harm Europe, Brussels, 25pp, <https://noharm-europe.org/sites/default/files/documents-files/3192/HCWH%20Europe%20report%20-%20Non-Toxic%20Healthcare.pdf>

<sup>14</sup> SCENIHR (2016) Opinion on the safety of medical devices containing DEHP-plasticized PVC or other plasticizers on neonates and other groups possibly at risk (2015 update). Publ: European Commission Scientific Committee on Emerging and Newly-Identified Health Risks, Brussels, 170pp., [http://ec.europa.eu/health/scientific\\_committees/emerging/docs/scenihr\\_o\\_047.pdf](http://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_047.pdf)

<sup>15</sup> SCENIHR (2016) Opinion on the safety of medical devices containing DEHP-plasticized PVC or other plasticizers on neonates and other groups possibly at risk (2015 update). Publ: European Commission Scientific Committee on Emerging and Newly-Identified Health Risks, Brussels, 170pp., [http://ec.europa.eu/health/scientific\\_committees/emerging/docs/scenihr\\_o\\_047.pdf](http://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_047.pdf)

<sup>16</sup> ECHA (2018) Candidate List of substances of very high concern for Authorisation. <https://echa.europa.eu/candidate-list-table>, accessed 9 Oct 2018



In can be found in catheters, medical tubing, syringes, haemodialysers, blood oxygenators, eye lenses, dental coatings and sealants, nebulisers and newborn incubators. BPA is an endocrine disruptor, capable of interfering with the action of estrogenic and thyroid hormones. Potential human health effects could be diabetes, immune and thyroid disruption, miscarriage, erectile dysfunction and impacts on the next generation including neurodevelopmental impairments, respiratory conditions, anxiety, depression and childhood obesity<sup>13</sup>.

Phthalate plasticisers, used to soften PVC, are also endocrine disruptors, and are found in numerous medical products, including IV lines and blood bags. The most widely used phthalate is DEHP, which has reproductive and developmental effects, testicular toxicity and causes liver cancer in rodents<sup>14</sup>. It can damage the unborn child and newborn, and peripubertal boys, whose developing reproductive systems are at risk<sup>15,16</sup>.

Replacing DEHP with alternate plasticisers may not prevent health impacts because alternatives have been linked to toxicity to the fetus, reproductive system, liver, kidney and endocrine disruption<sup>17,18,19</sup>. Conversely, replacing PVC with non-PVC can offer safer healthcare. [Using PVC-free infusion systems for newborn children in a German hospital resulted in a drop of liver problem from 50% to 13%](#)<sup>20</sup>.

Consequently, health authorities and medical associations in several countries, including the Philippines, the USA, Germany, Canada, the UK and the EU recommends that health care facilities use PVC-free products when high exposure risk procedures are to be performed, particularly on the most sensitive groups<sup>21</sup>. The Government of India has mandated the phase-out of chlorinated plastic bags and gloves<sup>22,23</sup>. The EU requires that

medical devices containing more than 0.1% w/w of DEHP or other highly toxic must be labelled<sup>24</sup>. This allows doctors and buyers to choose whether they use medical devices containing DEHP, but medical products elsewhere may have little or no labelling<sup>25</sup>.

After use, recycling is the best option, but is not feasible for a lot of products. The last two years has seen a revolution in the global plastics recycling market, starting with China's decision to stop accepting low grade plastics from the beginning of 2018. Since then millions of tonnes of plastic waste has been diverted to other countries in South-East Asia and India and Malaysia are now refusing to accept it and there are increasing calls for rich countries to take back unwanted and worthless waste<sup>26</sup>. The EU recognises the need to stop waste exports, eliminate unnecessary products and improve local recycling in its strategy for plastics in the circular economy<sup>27</sup>.

At the end of the product life, burning or incinerating releases large amounts of pollution. Healthcare waste incineration, along with garbage incineration, has been identified as among the largest sources of dioxins and furans to the atmosphere, globally. Moreover, around three tonnes of carbon dioxide for every tonne of plastic waste. Globally this adds up to millions of tonnes of carbon dioxide, more than any other waste disposal option. [The entire plastics life cycle has a large carbon footprint; in 2019 producing and burning plastics will produce as much carbon dioxide- 850 million tonnes- as 189 five hundred megawatt coal-fired power plants. This is projected to grow to 2.75 billion metric tonnes per annum by 2050 unless the expansion of plastics consumption is curbed , undoing much of the efforts to decarbonize our economies and prevent climate chaos.](#)

<sup>17</sup> Kambia, N.K. et al. (2019) In vitro and in silico hormonal activity studies of di-(2-ethylhexyl) terephthalate, a di-(2-ethylhexyl) phthalate substitute used in medical devices, and its metabolites. *Journal of Applied Toxicology*: 1-4, DOI: 10.1002/jat.3792

<sup>18</sup> SCENIHR (2016) Opinion on The safety of medical devices containing DEHP plasticized PVC or other plasticizers on neonates and other groups possibly at risk (2015 update): Revision February 2016. Publ: European Commission, Scientific Committee on Emergency and Newly Identified Health Risks, 170pp, [http://ec.europa.eu/health/scientific\\_committees/emerging/docs/scenihr\\_o\\_047.pdf](http://ec.europa.eu/health/scientific_committees/emerging/docs/scenihr_o_047.pdf)

<sup>19</sup> ECHA (2018) Candidate List of substances of very high concern for Authorisation. <https://echa.europa.eu/candidate-list-table>, accessed 9 Oct 2018

<sup>20</sup> Von Rettberg et al. (2009) Use of Di(2-Ethylhexyl)Phthalate-Containing Infusion Systems Increases the Risk for Cholestasis. *Pediatrics* 124(2): 710:716

<sup>21</sup> Philippine Department of Health (2008) Advisory Medical Devices containing DEHP plasticised DEHP. Publ: DoH, 3pp., [https://www.doh.gov.ph/sites/default/files/health\\_alerts/advisory\\_medical\\_devices\\_20080603.pdf](https://www.doh.gov.ph/sites/default/files/health_alerts/advisory_medical_devices_20080603.pdf)

<sup>22</sup> Government of India (2016) Bio-medical waste rules, 2016, Publ: MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, 37pp, [http://www.cpcb.nic.in/divisionsofheadoffice/hwmd/Bio-medical\\_Waste\\_Management\\_Rules\\_2016.pdf](http://www.cpcb.nic.in/divisionsofheadoffice/hwmd/Bio-medical_Waste_Management_Rules_2016.pdf)

<sup>23</sup> Government of India (2018) Biomedical rules update 2018, <http://moef.gov.in/g-s-r-234e16-03-2018-the-bio-medical-waste-managementamendment-rules-2018/>

<sup>24</sup> Fernandez-Canal et al. (2018) Patients' exposure to PVC plasticizers from ECMO circuits. *Expert review of medical devices* 15(5): 377-383, <https://www.ncbi.nlm.nih.gov/pubmed/29658331#>

<sup>25</sup> HCWH Asia

<sup>26</sup> Ellis\_Petersen, H. (2019) Treated like trash, *The Guardian*, London, 28 May 2019 <https://www.theguardian.com/environment/2019/may/28/treated-like-trash-south-east-asia-vows-to-return-mountains-of-rubbish-from-west>

<sup>27</sup> EC (2019) A circular economy for plastics: Insights from research and innovation to inform policy and funding decisions. Publ: European Commission, Brussels, <https://publications.europa.eu/en/publication-detail/-/publication/33251cf9-3b0b-11e9-8d04-01aa75ed71a1/language-en/format-PDF/source-87705298>



# PLASTICS IN THE ENVIRONMENT

Image by The Green Huzb

Between 4.8 and 12.7 million tonnes of plastic waste are estimated to enter the global oceans every year and is having a huge impact on ocean life. Seabirds, turtles, fish, dolphins and whales are being found dead with stomachs full of plastics; UNESCO estimate that one million seabirds and 100,000 marine mammals per year die from ingesting plastic<sup>30</sup>.

Microplastics are fragments of plastic less than 5mm long. They may be formed as larger plastic products, including synthetic fabrics, break down or be intentionally created, particularly as a component of personal hygiene products like skin cleansers and toothpastes<sup>31,32</sup>.

They are now found all through the natural environment, including rivers, lakes and seas, soils, and even glaciers.

Microbeads were banned in personal care products in the USA<sup>33</sup> and several European member states; an EU-wide consultation on restricting microbeads is under way<sup>34</sup>.

They are also suspected of harming wildlife, and concentrating hazardous chemicals in the environment, which can be consumed by animals and then carried up the food chain. Effects on humans are not certain yet, but as well as the potential exposure to microplastics and associated chemicals, pathogens such as *E. coli* and *Vibrio* spp. have been found on “nurdles”, plastic fragments floating in the ocean. It is possible that they could carry dangerous pathogens from one continent to another<sup>35</sup>.



Small pieces of plastic are called microplastics.  
Image by Florida Sea Grant



Tiny bits of plastic often found in beauty products are called microbeads. Image from imagehub88 GettyImages stockphoto

<sup>28</sup> GAIA (2019) The Hidden Climate Polluter: Plastic Incineration. <https://www.no-burn.org/hiddenclimatpolluter/>

<sup>29</sup> CIEL and partners (2019) Plastic and climate: the hidden costs of a plastic planet. Publ: CIEL, Geneva, 108pp, <https://www.ciel.org/plasticandclimate/>

<sup>30</sup> UNESCO (2019) Facts and figures on marine pollution. <http://www.unesco.org/new/en/natural-sciences/ioc-oceans/focus-areas/rio-20-ocean/blueprint-for-the-future-we-want/marine-pollution/facts-and-figures-on-marine-pollution/>, accessed 15 May 2019

<sup>31</sup> NOAA (2019) What are microplastics? <https://oceanservice.noaa.gov/facts/microplastics.html>

<sup>32</sup> ECHA (2019) Microplastics <https://echa.europa.eu/hot-topics/microplastics>

<sup>33</sup> USA (2015) Microbead-Free Waters Act of 2015 <https://www.govinfo.gov/content/pkg/BILLS-114hr1321enr/pdf/BILLS-114hr1321enr.pdf>

<sup>34</sup> ECHA (2019) Microplastics <https://echa.europa.eu/hot-topics/microplastics>

<sup>35</sup> Rodrigues, A. et al. (2019) Colonisation of plastic pellets (nurdles) by *E. coli* at public bathing beaches. *Marine Pollution Bulletin* 139: 376-380

# HOW TO CONDUCT A PLASTICS AUDIT

A plastics audit is an important way to identify and quantify the plastics in a healthcare facility. It is particularly valuable at the start of a plastics project as it can help guide decision-makers as to the best ways to reduce the amount and toxicity of plastic waste.

It will also be valuable to repeat audits periodically to check on the success of initiatives, and to gather further information about the way the waste is generated. For example, seasonal patterns of disease may mean the more, or different waste is produced at different times of the year.

Audits can be repeated at need, either to find out how waste changes through the year, or to gauge the impact of changes in practice or measures to reduce plastic waste.

- Brief staff in advance, and gather equipment and prepare the audit area, so that everything is ready to go on the day;
- Schedule plenty of time for the audit, including time to clean up at the end of the day.

## STEP BY STEP PLASTICS AUDIT

- 1 • Decide on the scope and purpose of the audit  
• Identify audit site, and staff resources required. Gather necessary equipment
- 2 • Prepare audit site, brief staff, assign teams  
• Collect waste for auditing
- 3 • Team 1 selects bag for auditing  
• Weigh, record waste type and weight
- 4 • Separate plastic waste from other types of waste, including emptying plastic containers  
• Record weight of plastic waste and discard other waste
- 5 • Team 2 sorts plastic waste into categories  
• Weigh and record weight of each category
- 6 • Discard waste appropriately after weighing  
• Clean equipment and PPE, wash before resuming other tasks
- 7 • Analyse data and set targets and goals for action



## 1. PLANNING

### Decide the Scope and Purpose of the audit

The management team should decide on the purpose and scope of the audit as this will direct the steps to be undertaken

- Know the scope of the audit. Select whether to audit a particular area (eg. ward, department, office) within the hospital or the entire hospital;
- Decide on the duration of the audit.
  - A week of audit compensates for fluctuations in waste generation, but requires significantly more effort;
  - As a minimum, aim to audit all the waste generated during a 24-hour period;
- Work out how much waste you can manage. This will be dictated by the number of available personnel for the audit, the weight of wastes generated daily, and the space and equipment available.
  - Ideally, it will be possible to handle the waste from the entire facility. If not, an alternate strategy is to address sections of the hospital one at a time or select a representative fraction of the waste from the facility to audit. This last strategy increases the uncertainty in the results and should be avoided if possible;

- Decide what your primary aims are. As well as finding out how much waste the healthcare facility generates, other valuable information may be on the amounts of single-use plastics that could easily be eliminated; the amount of waste that could be recycled, or whether any particular part of the facility has excessive plastic waste that needs further investigation and action.

### Identify audit site and staff resources required

#### Site Identification

- The audit area should be easy to clean and with access to toilet and wash area. It should have protection from sun or adverse weather conditions;
- Space needed will depend on the amount of waste being audited. Auditing can be facilitated by having dedicated spaces for different phases of the audit: eg 1) sorting plastics from other waste (approx. 4mx2m); 2) segregating different types of plastics; (approx. 4mx2m); 3) collecting different types of plastics (approx. 4mx2m).

#### Staff resources

- Management staff need to plan the audit, ensuring it is properly carried out and implementing actions based on the results;
- Involve as many staff as possible in audits, even if you are engaging expert help. Auditing is labour intensive and including staff from different departments can raise awareness about the issue;

- Involve staff who are experienced with handling infectious and hazardous materials to help supervise and make sure all wastes are handled safely and according to national standards;
- Two teams are recommended, one for Phase 1 (separating plastics from non-plastics) and one for Phase 2 (separating plastic wastes into identified categories):
  - Phase 1 Team – 2 sorters, 1 weigher and 1 recorder;
  - Phase 2 Audit Team composition – at least two sorters, 1 weigher and recorder.

- Staff needs to be able to do a good job. Schedule plenty of time for the audit, including the time to clean up at the end of the day, and to write up, interpret and communicate the results.

### Gather Necessary Equipment

Much of the equipment will be easily obtained, but it is important that high-quality scales are used so that data are reliable.

## EQUIPMENT LIST

Personal protective equipment for each member of the audit team, plus spare in case of failure. Be sure that different sizes are available to suit male and female staff.

- Rubber gloves
- Closed shoes/boots
- Aprons/overalls
- Face mask



### Waste handling equipment

- Sorting tables
- Bin bags of each color used in the facility;
- Long-handled tongs: waste should not be handled manually;
- Buckets or similar containers for liquid/semi-liquid waste (e.g. food waste or liquid from partially used IV bags);
- Sharps containers;
- Needle/hub cutters

### Weighing equipment

- Weighing scale up to 20kg in 1g increments- to weigh unsorted bags and heavier items (e.g. buckets of food waste). A hanging balance may be useful for weighing bags;
- Weighing scale of up to 2 kg in 0.1 g increments- to weigh smaller items;
- Containers to fit on the smaller scale, allowing as many plastic items as possible to be weighed together;
- Stable tables for sensitive scales. In the absence of enclosed rooms near the sorting area, makeshift dividers may be provided to protect scales

from wind.

### Cleanliness and safety

- Depending on the location, tarpaulin or plastic sheeting for the floor or other working area;
- Soap and access to water/washrooms
- Paper towels;
- Alcohol-based hand sanitizer;
- Spill cleanup kits for mercury or other hazardous materials;
- Disinfectant and floor cleaning equipment;
- First aid kit

### Record-keeping

- Clipboard, data forms, pens/pencils or tablet for collecting data
- Camera for photo documentation
- Laptop for data entry (this can be done during or after the audit, depending on the availability of resources)

## 2. PREPARATION

### Prepare Audit Site

- Set up sorting tables and/or prepare floor area for sorting waste. If necessary, spread plastic sheeting where wastes will be placed;
- Set up weighing and recording areas. Use sturdy and stable tables for sensitive scales and tables/chairs for team members responsible for weighing waste and recording data. If working outdoors, set up wind breaks to protect sensitive scales from air movement;
- Prepare a separate table for other equipment such as PPE (aprons, masks, gloves, tongs), recording sheets and pens, containers, sanitation and first aid (first aid kit, alcohol-based hand sanitizer, soap and paper towels) etc;
- Place chairs near the sorting area should participants need to take breaks.

### Brief and Assign Teams

- Gather the participants of the audit;
- Ensure that all needed materials and equipment are available;
- Ensure that all teams/participants are present and are wearing their respective PPE;
- Ensure that the team is familiar with the audit steps and waste segregation categories;
- Direct them to their assigned areas.



### Collect Waste

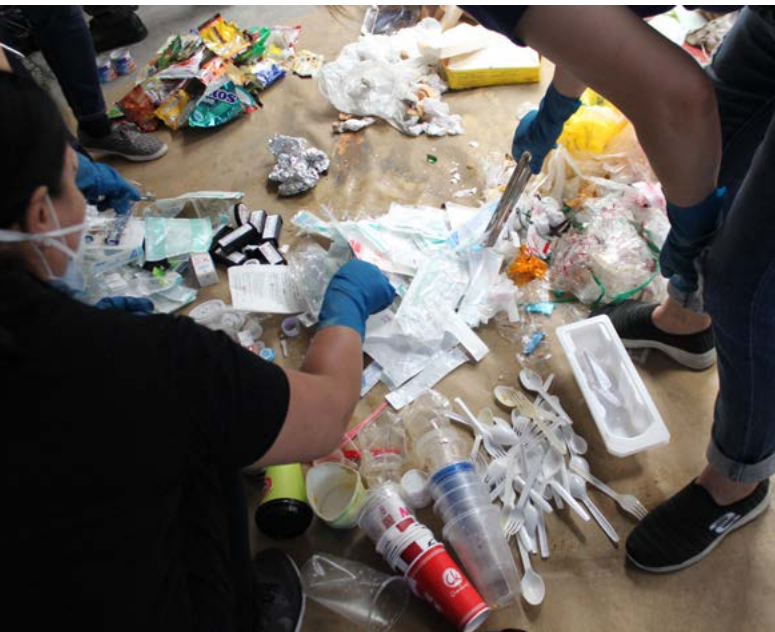
- Collection of waste should start a day before the audit proper;
- Tag waste bags should be tagged on collection with the following information:
  - Name of the department, ward or office;
  - Time and date of collection;
- Bring waste in the audit area;
- Maintain waste segregation: group non-biodegradable, biodegradable, infectious and sharp containers together.



## 3. WEIGH UNSORTED WASTE, RECORD WASTE TYPE AND WEIGHTS

- Work on one waste category at a time. Start with non-hazardous waste, e.g. kitchen or general waste, and move on to infectious waste or hazardous materials. This allows teams to become familiar with techniques when working on non-hazardous materials and prevents contamination of non-hazardous materials with infectious or hazardous materials;
- Weigh each waste bag prior to segregating the plastic and non-plastics wastes. The recorder will write down the weight;
- If wards or healthcare facility sectors are being considered separately, use a different form for each. The assigned recorder will write down the weight of each unsorted bag and enter it in the relevant section of the data collection form.





#### 4. PHASE 1: SEPARATE PLASTIC FROM OTHER TYPES OF WASTE

- Separate plastics from non-plastic wastes;
- Empty containers with liquid or solid items into designated bins and/or containers;
- Insofar as is relevant to the objectives of the audit, separate the non-plastic waste into the different categories in the audit tool. Weigh and record them in the relevant category of the “post separation” section of the audit form;
- Dispose of non-plastic waste appropriately. Reuse the original waste bags if possible.

#### 5. PHASE 2: SORT PLASTICS INTO CATEGORIES

- In the Phase 2 audit area, separate the plastic items into these categories:
  - Medical-related plastic items (syringes, bottles, bags)
  - Non- Medical plastic items (Packaging, foodware)
  - Others
- Place the sorted plastic waste in a new waste bag or container;
- Weigh carefully, using the more precise scales. Ensure that no individual is resting on the table or breathing too close at the scale. The scales are quite sensitive. Wait for the numbers shown at the weighing scale to stabilize before recording;
- Record data for each type of plastic waste in the “post separation” section of the form.

#### 6. CLEAN-UP

##### Audit Area

- After the weighing is done, place waste in appropriate bags for disposal. Discard audited wastes appropriately;
- Ensure that the area is cleaned and sanitized;
- Clean equipment;
- Handle sensitive items such as the scale with care.

##### Participants

- Wash gloved hands with soap and water;
- Remove PPE;
- Wash hands with soap and water;
- Sanitize washed hand with alcohol.





## 7. ANALYZE DATA AND SET GOALS

- Input the recorded data in the Baseline Assessment Tool (Excel file) provided below;
- If available, include data on the costs of disposal and recycling value of different types of waste;
- Consider the data summaries provided by the tool;
- Conduct further data analysis as maybe necessary;
- Use this to 1) debrief the participants; and 2) discuss possible actions with hospital management. Refer to the Hospital Action section to identify possible interventions for specific generated plastic waste stream;
- In discussing possible action and setting goals, consider the following:
  - if any wastes can be eliminated;
  - what actions can be taken to reduce the largest fractions of waste;
  - if recycling can be increased;
  - which actions might reduce the net cost of waste disposal;
  - whether more research is needed to clarify actions
- Discuss results with the stakeholders of the hospital. Make the discussion as inclusive as possible with representatives from the various departments. This is in order to gather inputs that are truly based on the daily hospital operation and promote ownership of the discussed and implemented solutions or actions.

READY TO CONDUCT YOUR FIRST  
HOSPITAL PLASTIC AUDIT?

Click this Link to Download the Plastic Assessment Tool

# HOSPITAL ACTION



## GUIDANCE ON HOW TO REDUCE PLASTICS WITHIN HEALTHCARE

If you have conducted an audit, it will clarify the areas where the easiest and largest gains can be made, and also on which areas will require longer term planning and effort. In either case, the same framework can help.



### 1. CHOOSE YOUR TARGET

Be as specific as possible about this. Include the category of plastic or product to be addressed, an amount of percentage that should be changed, and a deadline. It is important to have measurable outcomes and targets so that you can track progress. Targets might address the whole facility or one department; be achievable in one step or be phased over time.

Examples might be:

- Eliminate disposable knives forks, spoons, straws and stirrers from the facility canteen immediately;
- Set a procurement policy to reduce plastics use;
- Ban the use of disposable plates, bowls and clamshells in outsourced food services the next time the contract is renewed;
- Double the amount of plastics recycling by the end of the next calendar year;
- Prohibit the purchasing of PVC gloves for the facility immediately;
- Substitute PVC enteral feeding bags in the neonatal intensive care unit within 12 months;
- Reduce plastic waste to landfill/incineration by 90% within 3 years;
- Reduce plastics and avoid PVC in construction;
- Eliminate PVC from the whole facility within 5 years.



## 2. IDENTIFY ALTERNATIVES

Alternatives may be new products, new ways of working or new ways of handling or disposing of waste.

In some cases, the alternatives may be clearly defined. For example, switching from plastic to paper straws or from PVC to nitrile gloves is comparatively simple. Identifying an alternative to a medical product such as an enteric feeding bag, which delivers nutrition directly into the intestines of a patient, will be more complex.

In cases like these, it will be necessary to make up clear specifications regarding medical functionality, compatibility with other equipment and the polymers and additives which are and are not allowable. These will be a guide to discussions with suppliers, or part of an invitation to bid on a procurement contract. Check resources such as the HCWH Europe database of non-PVC medical devices<sup>36</sup> to identify potential products and suppliers, including overseas manufacturers. Check with your supplier to see which are available where you are and compare potential alternatives to identify the best and most economical for testing.

Regarding waste disposal, it may be that existing waste contractors will accept recyclables as well as the current waste stream. Otherwise, map local recyclers and discuss with them what they can accept, how to ensure that it is of a suitable quality in terms of cleanliness and segregation, and how much must be collected for it to be worthwhile to collect the waste. It may be necessary to engage with several specialist waste recycling and disposal contractors to get the most from the waste stream.

## 3. TEST ALTERNATIVES

Testing is an important part of introducing a new product or practice, and especially when considering a medical product. Staff should be trained in how to use a new product and given the opportunity to trial it on a limited basis before it goes into full use.

They should be consulted on new practices, such as segregation, so that it fits with their working practices. Apparently small considerations such as the number and placement of segregation bins can be a significant factor in and the success of segregation systems and allowing staff to decide on the design and setup of the system on their ward can greatly enhance their engagement and participation.



<sup>36</sup> HCWH Europe. Safer Medical Devices Database. <https://noharm-europe.org/issues/europe/medical-devices-database>



## 4. MAKE A POLICY DECISION

Once a better product or practice has been identified, it can be a good idea to put it into healthcare facility policy.

Policies on procurement, training, and waste disposal all have the power to reduce the amount and nature of plastic waste.

If the hospital has an environmental policy, it can be linked to targets there, or it can stand alone. Consider key aspects for making a good policy, including a high level of human health protection.

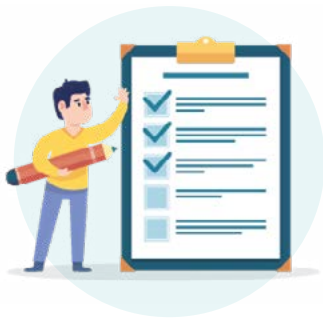


## 5. IMPLEMENT THE POLICY

Assign people to implement the policy and make sure everyone knows their responsibilities. Provide the financial and other resources that are needed. Set timelines and have regular meetings to track progress. It may help to have a separate committee on this or incorporate it as a regular item on management, procurement, waste or sustainability committees.

Ensure that all staff knows about the policy. Training and regular updates will help them realize the importance of the policy and how to support it.

In addition, inform and educate visitors with posters.



## 6. MEASURE SUCCESS

Goals should always have measurable components so you can be sure that you are achieving them. Data might come from the procurement department - track plastics procurement, waste generation and disposal to measure progress towards the original goals. Consider joining the GGHH waste challenge, which sets targets for waste generation and recycling. Publish your results through GGHH case studies or other avenues.



## 7. FOLLOW UP

Review goals regularly, and if necessary take further action to make sure that they are met. Few healthcare facilities are able to tackle all issues simultaneously. Increase targets and expand the areas of action each year.

Share experiences with other healthcare facilities and medical professionals. Learn from their successes, and adopt the latest best practices and products.

# ACTION POINTS FOR EACH WASTE STREAM

MEDICAL ITEMS	
<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Substitute single use surgical gown caps, shoe covers etc. with washable cotton alternatives</li> </ul>	<p><b>Reduce waste volume and/or toxicity</b></p> <ul style="list-style-type: none"> <li>• Offer oral rather than injectable medication wherever possible;</li> <li>• Review procedures for glove use, reduce numbers used;</li> <li>• Reduce use of disposable wipes;</li> <li>• Substitute PVC or latex gloves with nitrile</li> </ul>
	<p><b>Recycle</b></p> <ul style="list-style-type: none"> <li>• Recycle IV bottles and other sterile liquid containers (e.g. dialyser fluid containers);</li> <li>• Cut the needle from syringes, and recycle syringes after disinfection</li> </ul>
SANITARY ITEMS	PACKAGING
<p><b>Reduce waste volume and/or toxicity</b></p> <ul style="list-style-type: none"> <li>• Introduce washable cotton diapers in neonatal and pediatric units and instruct parents in their use;</li> <li>• Raise awareness of feminine hygiene products with reduced plastic, such as menstrual cups or tampons with cardboard applicators.</li> </ul>	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Purchase reusable products: fewer replacements means less packaging overall;</li> <li>• Discuss packaging with purchasing/suppliers and select products with the least possible packaging;</li> <li>• Avoid products packaged in PVC (e.g. blister packs).</li> </ul>
DRINK BOTTLES	
<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Introduce drinking water dispensers and drinking water fountains for patients, staff and visitors;</li> <li>• Provide jugs of water and glasses for meetings, and in canteens;</li> <li>• Offer refillable water bottles in facility shops;</li> <li>• Cease selling bottled water in facility shops;</li> <li>• Cease selling bottled drinks, especially high-sugar products, in facility shops</li> </ul>	<p><b>Reduce waste volume and/or toxicity</b></p> <ul style="list-style-type: none"> <li>• Raise awareness of the need to reduce plastic bottle waste</li> </ul> <p><b>Recycle</b></p> <ul style="list-style-type: none"> <li>• Collect and recycle used drinks bottles</li> </ul>
FOODWARE	
<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Use reusable plates, knives/forks/spoons/stirrers/chopsticks in canteens and patient food service;</li> <li>• Eliminate drinking straws or replace with paper straws wherever possible; offer plastic or reusable straws as necessary for individuals with special needs;</li> <li>• Ban styrofoam food containers from the facility;</li> <li>• Use reusable drinks cups in canteens, meetings and patient service<sup>37</sup></li> </ul>	<p><b>Reduce waste volume and/or toxicity</b></p> <ul style="list-style-type: none"> <li>• Raise awareness about the problems with disposable foodware with staff and patients</li> </ul>
TOILETRIES	
<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Remove disposable wipes from facility shops and patient packs;</li> <li>• Remove personal care products containing microbeads from facility shops and patient packs;</li> <li>• Install refillable soap/cleaning fluid dispensers in toilets etc and buy liquid soap in bulk containers</li> </ul>	<p><b>Reduce waste volume and/or toxicity</b></p> <ul style="list-style-type: none"> <li>• Raise awareness of problems with disposable wipes and microbeads</li> </ul>

<sup>37</sup> Innovative alternatives to disposable cups includes a reusable, returnable "smart cup" under development in Europe  
<http://stisolutions4sdgs.globalinnovationexchange.org/innovations/smart-reusable-cup-alternative-wasteful-one-time-plastic-cups>

# GUIDANCE ON STRENGTHENING **HOSPITAL** **COMMUNICATIONS CAPACITY**

Considering the influential and trusted position of the healthcare sector in society, this set of recommendations will help hospitals craft communication strategies that will raise awareness on the plastics crisis and highlight the critical role of health professionals in creating social and behavioural change in the hospital and the broader community.



## COMMUNICATION STRATEGY RECOMMENDATIONS FOR HEALTH PROFESSIONALS:



### BE INFORMED

Health professionals should consider harmful plastics in the hospital as a major risk factor for patients, staff and the wider public. Thus, round-table discussions, sit-ins, webinars or lectures can be conducted to collectively understand the various sources of plastic, their types, the existence or nonexistence of necessary waste management policies or legislations, and the bigger risk harmful plastics can cause on the public's health.



### RESEARCH, PUBLISH AND SHARE EXTENSIVELY

Health professionals are known to produce case studies or research papers on various health and medical topics; therefore, these mediums can be used to integrate links between mismanagement of plastic waste in hospitals and human and planetary health. These materials can then be translated into forums, round-table-discussions, webinars, press statements, social media posts, infographics, factsheets, clinic brochures and even editorials that will affect social and behaviour change across sectors.



### USE CREATIVE METHODS TO RAISE AWARENESS AND PRESCRIBE SOLUTIONS

There are a million different ways to raise awareness and expand the knowledge of the public and considering the given topic, it can be tricky to keep your audience engaged. Take note that the public is always attracted to visuals and unique narratives, so now you can consider making use of social media platforms like Facebook, Instagram and Twitter. You may also raise awareness through film-screenings, educational exhibits, contests, flash mobs, dinner-for-a-cause, stage plays, challenges, giving of awards, petition signings, and so much more. Just make sure these activities are plastic-free.



### LEAD BY EXAMPLE IN THE HOSPITAL AND THE COMMUNITY

Health professionals have the capacity and position to educate patients, hospital staff, management, community as well as the decision-makers. Therefore, you can be effective influencers in the hospital, in communities and even in relevant government ministries.

# POLICY ACTIONS FOR GOVERNMENTS

- 1** Mandate the labelling and phase-out of toxic plastic materials in healthcare. The Philippines is one of several countries to issue advisories recommending avoidance of DEHP-plasticised PVC for vulnerable patient groups. However, many healthcare professionals are not even aware that the products they are using contain National governments should go further and require manufacturers to label any products that contain toxic components, and set dates for them to be replaced with the safest alternatives. Governments can also lead the way by phasing toxic plastics out from their own procurement policies.
- 2** Ban single-use plastic. The City of San Fernando, Province of Pampanga enacted in 2014 a local ordinance regulating the use of plastics while promoting reusable bags, and prohibiting the use of polystyrene (styro) for food products. San Fernando's commitment to zero waste is translated to its support for plastic waste audit in hospitals that began in 2017 and has continued to 2019. Upon seeing the audit results and recommendations of hospitals, the local government through the City Environment and Natural Resources Office is now bent in developing a new policy to support and at the same time issue better regulatory measure for hospital waste management.
- 3** Pursue Basel Convention by not allowing imported plastic waste. In May 2019, the 14th Meeting of the Conference of the Parties to the Basel Convention agreed to include mixed, unrecyclable and contaminated plastic waste exports into the control regime that requires the consent of importing countries before waste exports can proceed. This is an international agreement to which most countries in the world are parties. It will help Asian countries to stem the inflow of plastic waste being dumped by developed economies, and which is causing significant pollution to land and sea. Hospitals and healthcare systems must urge their National Government to invoke Basel Convention to stop dumping of plastic waste from foreign sources.
- 4** Require extended producer responsibility (EPR): ensure that companies throughout the plastics value chain shoulder the costs of collection recycling and safe disposal. EPR is considered high impact action in 3 counts: life-cycle approach, non-climate impact particularly in the attainment for example of sustainable development goals, and feasibility for implementation<sup>38</sup>.
- 5** Ban styrofoam/plastic straws/disposable plastic bags - there are specific items that local government units can do in addressing single use plastic such as banning of specific items such as styro, plastic straws, disposable plastic bags. Hospitals can urge the local government by modeling such bans in their healthcare facilities.
- 6** Launch public education and communication campaigns on plastic pollution - hospitals must encourage local government units to undertake education and public information campaigns by coordinating their own education and information campaign on plastic pollution in the hospital. In Mary Johnston Hospital, this was done by integrating orientation sessions among hospital staff in its human resource development and performance evaluation system. Next, the MJH intends to educate

<sup>38</sup> CIEL and partners (2019) Plastic and climate: the hidden costs of a plastic planet. Publ: CIEL, Geneva, 108pp, <https://www.ciel.org/plasticandclimate/>, page 85



the communities around its facility through coordination with the Local Government.

**7** Make hospitals part of zero waste city policy. This has been shown in the case of San Fernando City, a prime advocate of zero waste with effective programming of waste minimization and segregation at source, at the household and village level. Recently it has helped facilitate plastic waste audits in three hospitals in the city.

**8** Draft a Ministry of Health (MOH) level policy to ban unnecessary single-use plastic in hospitals. The individual hospitals' efforts on reducing plastic waste must lead to advocating to the MOH to institutionalize healthcare action against single-use plastic and other dimensions of plastic pollution.

**9** Submit clear position papers on health effects of plastic as it impacts the human population, the environment, the oceans, and climate.

## INDUSTRY ACTIONS

**1** Eliminate the use of hazardous additives in plastics manufacturing;

**2** Phase out the use of toxic plastics, such as PVC, polycarbonates and polyurethane;

**3** Phase in new non-toxic polymers such as polyolefin thermoplastic elastomers (TPEs);

**4** Redesign products including medical products, to maximise reusability;

**5** Redesign products and packaging for recyclability;

**6** Reduce volume and density of plastic packaging.





# CASE STUDIES ON PLASTICS IN HEALTHCARE

## Plastics and the Healthcare Sector

Healthcare waste is inevitably generated daily operation of every hospital. Much of this is plastic waste, which is non-biodegradable, includes items that release toxins during use or when incinerated. While plastics remain an essential commodity in hospital, replacement and reduction of plastics use, especially single-use and hazardous plastic in medical setting is also necessary.

Health Care Without Harm Southeast Asia recently reported on audits from three hospitals in the Philippines and two in Indonesia<sup>39</sup>. These hospitals are as follows.

### Philippines

- Alabang Medical Clinic
- Mary Johnston Hospital
- St. Paul Hospital Cavite

### Indonesia

- Universitas Gadjah Mada Academic Hospital
- Syamsudin Hospital

Major findings of the report included;

1. In the audited hospital waste, the amount of plastic ranges from 40%- 70%;
2. The majority of hospital plastic waste has no label regarding the plastic category which makes recycling and considering safer plastic alternatives difficult;
3. About 40% - 80% of the items depending on the hospital has no manufacturer's name which hinders traceability and accountability.

These findings have empowered and encouraged these five hospitals to take action and responsibility in 1) avoiding use and finding alternatives to plastic to reduce plastic waste generation; 2) segregating at source to increase recycling and repurposing plastics; 3) communicating with manufacturers and other healthcare providers to drive the market and shift dependence on plastics.



# PLASTIC WASTE AUDIT EXPERIENCES IN THE PHILIPPINES AND INDONESIA

Five hospitals from the Philippines and Indonesia took part in plastics audits with Health Care Without Harm. These are their experiences and the actions they have been inspired to make.

The hospitals have presented objectives which are summarized below:

- Development of policies on healthcare waste management with focus on segregation at source of waste materials;
- Revision of policies and procurement practices to minimize utilization of plastic-based materials;
- Increasing the awareness of employees on waste management and the disadvantages of plastic-based materials;
- Continually and periodically monitoring the progress on plastics;
- Creating a baseline for the significant components of hospital waste management:
  - an overview of generated hospital waste in a 24-hour period;
  - the ratio of the general, non-infectious waste, biodegradable and infectious/hazardous wastes and sharps;
  - the amount of plastic wastes;
  - compliance with the segregation-at-source policy
- Identification of appropriate interventions to waste-related problems;
- Reduction of waste generation;
- Decrease the use of disposable plastics.

Since the audits, the hospitals have implemented interventions to improve waste management and reduce plastic use. The interventions, progress achieved, sustainability strategies and next steps of the hospitals are outlined in the case studies below.





## ALABANG MEDICAL CLINIC, PHILIPPINES

### Progress Achieved

The plastics waste audit conducted in partnership with Health Care Without Harm assisted the hospital to identify and acknowledge problems and concerns regarding plastics. The hospital has identified the following conclusion and actions to take:

### Conclusions

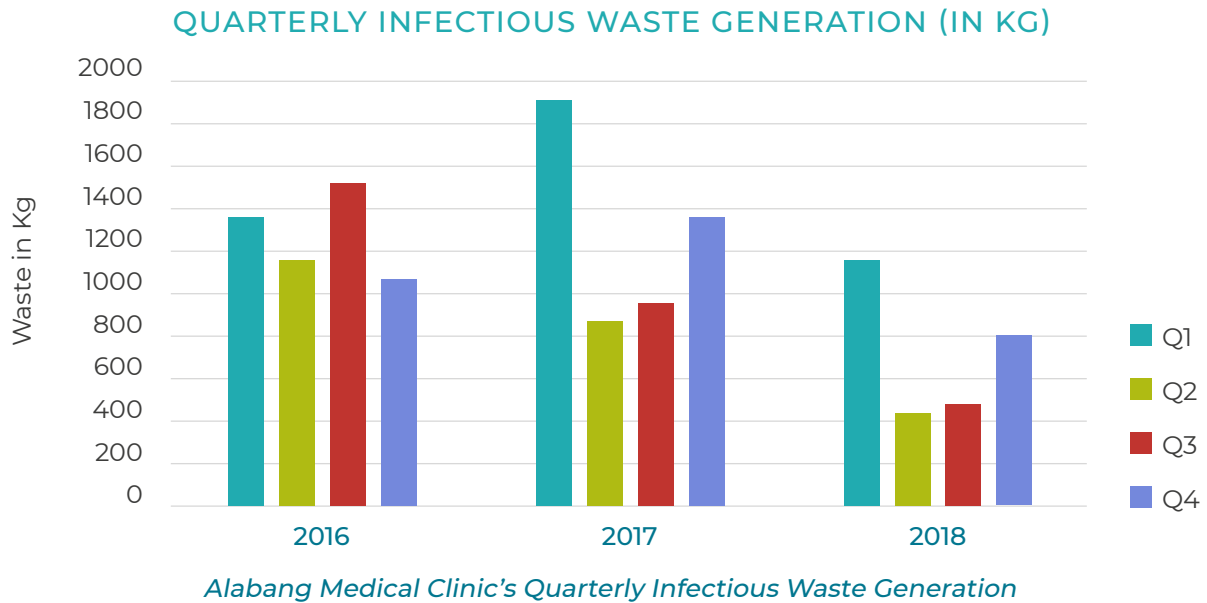
- Importance of segregation at source and procurement practices in the overall implementation of the Hospital Waste Management. This has led to plan the creation of Hospital Waste Management Committee, review qualification for suppliers and development of policies on plastics.
- The significance of tagging collected waste from wards, departments and offices to promote and ensure accountability for generated wastes;
- The use of yellow bags/bins for infectious waste was clarified, reducing the amount of infectious waste generated.

### Actions to take

- Provide drinking stations on each floor to reduce dependence on bottled water;
- Review the trash bins sizes and placement to increase compliance on waste segregation. This applies particularly to infectious waste bins. Since the audit infectious waste bins were removed from hallways, lobbies, non-medical offices and public toilets. They were placed only in infectious patients' rooms and critical areas such (nurses' stations and laboratories);
- Include weighing of generated waste during collection each shift to aid in monitoring the implementation of hospital waste management;
- Information and knowledge brings action which led to orientation of hospital employees during assemblies and patients' admission.

In the time that has passed, Alabang Medical Clinic was able to reduce the amount of generated infectious waste and

expenditure for treatment and disposal.



### Sustainability Strategies

The administrator and director of the hospital led the implementation of activities to strengthen their Hospital Waste Management. These are as follows:

#### Policy Implementation

- Creation of hospital waste management committee;
- Development of hospital waste management manual;
- Creation of policies regarding utilization of plastics;
- Review the qualification of suppliers to heighten procurement quality and standard

#### Advocacy and Increasing Awareness

- Orienting employees during assemblies and other hospital gatherings
- Taking action to make the segregation policies and reminders more visible and visual.
- Encouraging employees to use their own utensils and mugs.
- Strictly monitoring the hospital's canteen concessionaire in their implementation of no plastic utilization which includes packaging of take-out food, plates, cups, spoons and forks.
- Intensifying effort to increase compliance on segregation at source and recycling.

### Facility and Equipment Enhancement

- Installing drinking water stations on every floor of the new hospital building;
- Renovating and cleaning material recovery facility (MRF) and limiting access to authorized persons only;
- Recalibrating waste bins sizes to match them to the needs of the area (room, department, office).

#### Next Steps

Alabang Medical Clinic has identified several steps for them to improve their Hospital Waste Management and these are as follows:

- Establishment of Waste Management Committee to lead and monitor the implementation of activities and their progress.
- Development of Hospital Waste Management manual.
- Organizing storage area for waste which includes regular cleaning, placing labels, designated segregation area and limiting access.
- Increasing hospital awareness through orientations and noticeable visual reminders.
- Employing better procurement practices through promoting alternatives to plastics while meeting suppliers and other stakeholders.
- Conducting regular audits using the upcoming toolkit being developed.



## MARY JOHNSTON HOSPITAL, PHILIPPINES

### Progress Achieved

Intensification of waste management policies such as:

- Stricter monitoring of waste segregation at the different offices, departments and clinics including random checking of waste bins;
- Review of placement of waste bins, particularly the infectious waste bins (yellow bins). Yellow bins were taken out from the hallways lobbies and OPD clinics and patient rooms. They are now placed in locations away from the general public, such as such as the nurses' stations and OPD registration areas, where they can be monitored. Infectious patients are provided with separate infectious waste bins;
- Review of supplies and suppliers, led by central supplies staff

### Improvements in waste generation and management

- Decrease in volume of infectious waste generation. Noticeable decrease in infectious waste generation was observed in the last quarter of 2018, after the plastic waste audit;
- Reduction in expenditure for treatment and disposal of infectious waste. With the decrease in generated volume of infectious waste, the expenditure for treatment and disposal has also decreased.
- Improved segregation at source which led to increase in volume of waste recycled. Similarly, revenue from the recyclables have also increased.
- Provision of materials and equipment such as:
  - Tongs in waste bins to aid in monitoring and inspection (biodegradable and non-biodegradable wastes).
  - Housekeeping were provided with all-purpose gloves, tongs and reusable masks to aid them in managing waste, particularly in maintaining cleanliness.

## Sustainability Strategies

The Quality Assurance Team leads the strategies to sustain initiatives to address waste management and plastic use. The strategies they have employed are as follows:

- Reviewing policies related to waste management as well as procurement practices to facilitate reduction of waste generation and plastic use;
- Reorientation of employees on proper waste management and segregation at source.
- Reorientation of housekeeping personnel on waste management and maintaining cleanliness;
- Incentivizing efforts of the employees and housekeeping personnel;
- Departments and employees are recognized for proper waste segregation and waste reduction;
- Housekeeping are given 65% of the revenue from selling recyclables;
- Reviewing hospital items that may be replaced with a more sustainable and environmentally free alternative.
- Identifying priority items in procurement policies and initiative talks and coordination with suppliers.

## Next Steps

Mary Johnston Hospital has identified several activities to further improve their waste management system and reduce plastic waste:

- Strengthening the current waste management committee and reviewing the hospital waste management policy.
- Improving the hospital facility cafeteria. The hospital plans to employ concessionaires that will use reusable containers and provide discounts to those who will bring their own containers and utensils.
- Encouraging employees to eat their meals at the hospital cafeteria and pantries to lessen utilization of disposable utensils.
- Improve patients' kit by replacing plastic items with possible alternatives (eg. Plastic tote bag with cloth bags).
- Conduct waste audits regularly. The hospital may conduct them by department.



# ST. PAUL HOSPITAL CAVITE, PHILIPPINES

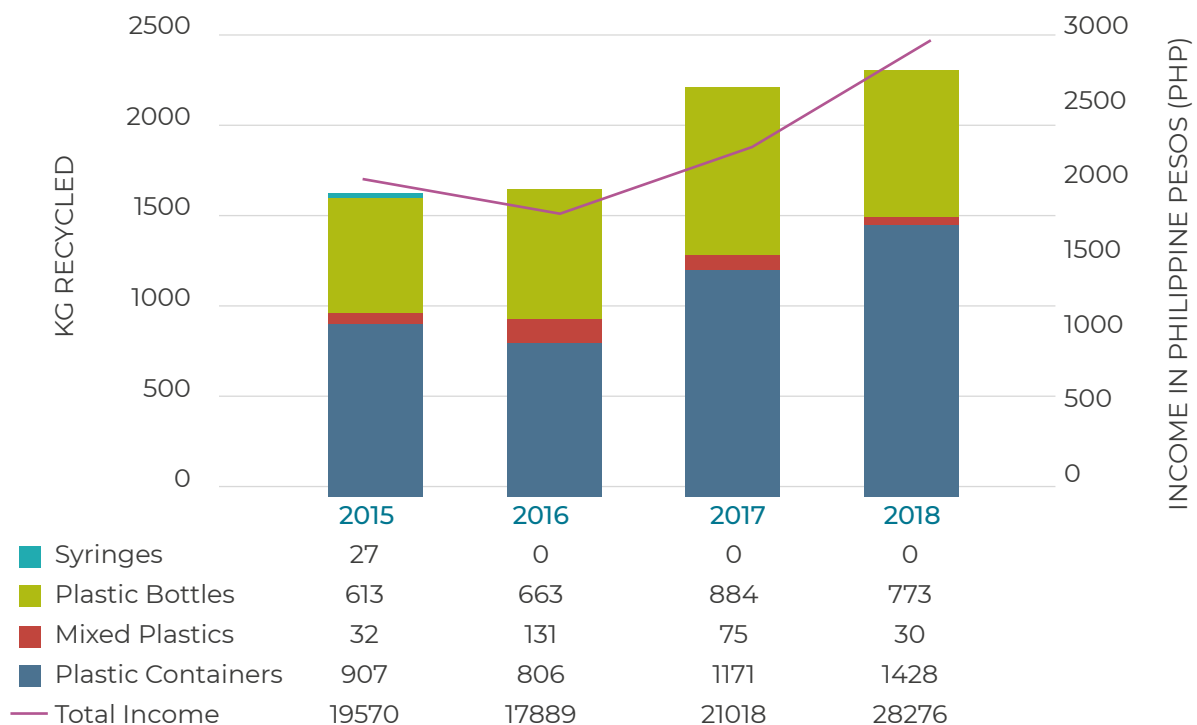
## Progress Achieved

Intensification of waste management policies such as:

- Implementation of waste reduction and management policies with focus on plastics.
  - Elimination of plastic utensils in cafeteria;
  - Refraining from single-use sachets such as coffee, sugar and cream;
  - Discouraging bottled water utilization;
  - Promoting usage of own utensils and water bottles;
  - Testing feasibility of using cloth diapers in NICU;
  - Returning excess packaging to supplies providers;
- Intensification of Segregation at Source policy leading to increase in waste diversion and recyclables collection.
- Increase in income from recycling.
- Reduction of general waste due to diversion of more discards to recycling and composting. It used to be that their residual waste was being collected once a month; now it only needs to be collected every other month.



## PLASTICS RECYCLING SPHC



*Amounts of plastics recycled by St Paul Hospital Cavite and income earned.*



## Sustainability Strategies

### Policy Implementation

Several policies were developed and cascaded to all department and employees of the hospital. These policies are easily implemented within the hospital facility. Among them are

- Reduction of non-essential plastic use such as elimination of plastic spoons, forks and other utensils in cafeteria;
- Refraining from coffee, sugar and cream individually packed in sachets;
- Discouraging consumption of bottled water within the hospital premises;
- Encouraging the employees to bring their own utensils and tumblers.

The hospital also advised the warehouse personnel to avoid and find alternatives for over- packaged products. At the moment they are returning the used packaging to the supplier during scheduled deliveries.

In its neonatal intensive care unit (NICU), the hospital is currently experimenting on utilizing cloth diapers. If the experiment proves to be successful, they will gradually expand it to other units to reduce the utilization of disposable diapers which liners are mostly made of plastics.

As part of the strategy to lessen plastic utilization and enhance segregation at source, infectious waste bins (yellow plastic lined bins) were taken out of in most patient rooms and toilets, hallways and other public areas. Infectious waste bins are only situated in rooms that has infectious patients and areas that critically need these bins such as nursing stations and operating rooms.

### Advocacy and Increasing Awareness

With the policies implemented, St Paul Hospital Cavite ensured that the rationale behind the policy implementation was understood. Waste Management with emphasis on the results of the plastics audit was repeatedly discussed in General Assemblies.

Waste management is included in the orientation packet and on-boarding procedure of newly hired nurses.

The hospital management distributed about 200 reusable stainless tumblers to doctors. It is within their plan to distribute tumblers to all St. Paul Hospital Cavite employees.



St. Paul Hospital Cavite assisted other institutions in their waste management and plastic reduction initiative by opening their hospitals to study tours, visits and knowledge exchange.

### Facility and Equipment Enhancement

To further reinforce policies implemented and initiatives on plastic waste management and reduction. The hospital has invested in facility and equipment upgrading. Water stations will be installed in significant and strategic areas of the hospital.

Currently, the hospital plans to install at least five water stations. These will be directly connected to hospital pipelines. Each water station has ultraviolet light filters (UV filters) and costs PHP 18,000. One has already been installed and awaiting water analysis results to confirm safety. Installation of the other four will follow.

A manual baling machine was purchased which aided in addressing residual plastic wastes. Residual plastic wastes are collected and placed in the baler. These plastic wastes are compacted into big cubes which are stackable and thus space-saving.

### Next Steps

After the conduct of the audit, St Paul Hospital Cavite has immediately installed water stations and implemented policies related to generation of plastic wastes. The hospital will also phase-out and eliminate juice beverages in plastic bottles and replace a number of products in sachets in the cafeteria soon.

The hospital is also looking into scheduling dialogues with their suppliers. In particular, the hospital will communicate with their hemodialysis equipment and materials suppliers to possibly negotiate take-back of used hemodialysis paraphernalia such as the tubing and dialyzers.

# UNIVERSITAS GADJAH MADA ACADEMIC HOSPITAL, INDONESIA



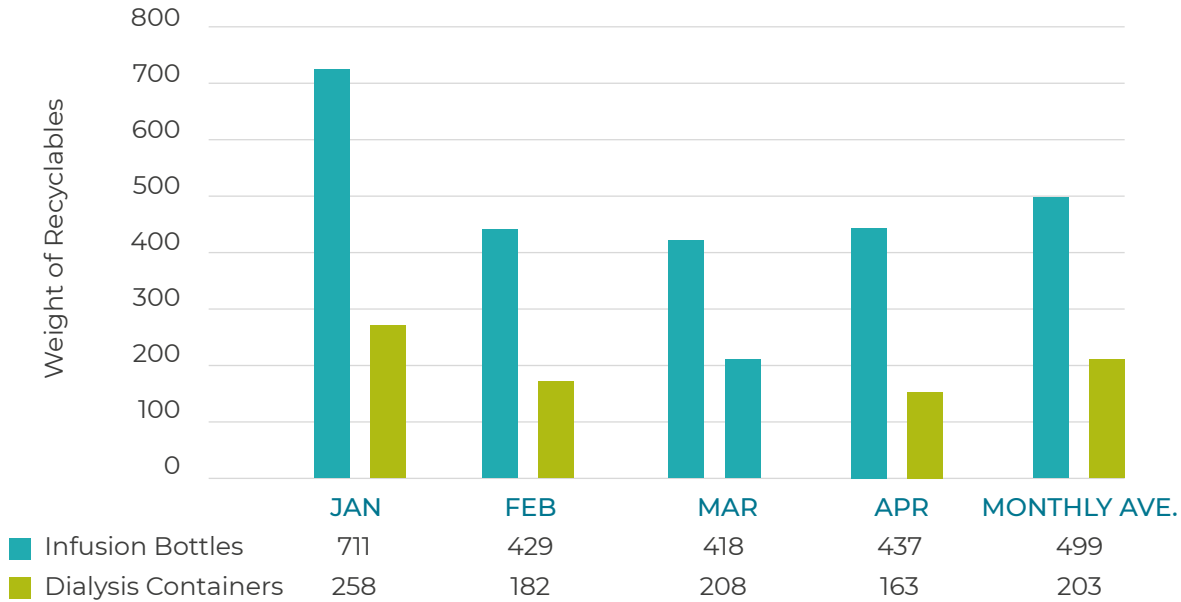
## Progress Achieved

Universitas Gadjah Mada Academic Hospital used the results of the plastic waste audit to define plans with corresponding policy interventions and activities, focused on elimination and reduction of plastics. These are as follows:

- Limiting the utilization of single –use plastic products, particularly in non-essential, non-medical applications.
- Discouraging the use of plastic bags and promoting the utilization of alternatives such as cloth, mesh and reusable bags.
- Educating employees and patients in using reusable water bottles, containers and utensils.
- Organization and education of a waste management team who will promote plastic reduction and proper segregation of waste.
- Preferential selection of non-plastic products and those which don't create plastic wastes.
- Increase in recyclables collections
- With these activities and policies implemented the hospital was able to recycle certain plastic wastes such the IV bottles and dialyzers starting year 2019 as shown by the graph below.



### WEIGHT OF ITEMS RECYCLED (IN KG)



*Weight of Recycled Plastic Wastes in UGM (infusion bottles and dialysis containers)*

#### Sustainability Strategies

Universitas Gadjah Mada Academic Hospital already has a Hospital Waste Management System and Waste Management Committee in place. However, to further enhance the sustainability of their efforts they are currently developing a Green Hospitals Committee. Apart from these, they have also adopted policies to further strengthen their Waste Management Program. These policies are as follows:

- Heightening implementation of Waste segregation within the hospital and its premises.
  - Within the hospital – organic, inorganic, infectious and hazardous waste
  - Within the premises – organic and inorganic wastes (glass, cans, metals)
- Policy on eliminating straws and plastic bottles in meetings
- Policy of encouraging utilization of reusable materials and utensils

#### Next Steps

Universitas Gadjah Mada Academic Hospital has identified several activities to incorporate in their plans to strengthen their Hospital Waste Management System. These are as follows:

- Procurement of equipment such as biodigester to aid disposal of organic waste;
- In order to assist the employees and reduce consumption of plastic bottles, they will be installing water stations around the hospital;
- They also plan to change packaging of the medicines supplied to patients and sold in the hospital;
- They will also campaign for the tenants and concessionaires to replace plastic packaging;
- Find alternative to plastic liner used in waste bins;
- Conducting regular audits using the upcoming toolkit being developed.

# HAVE QUESTIONS?

Need to learn more about HCWH Southeast Asia's campaign against plastics?

Send us an email!  
[info@no-harm.org](mailto:info@no-harm.org)

Stay Updated, Follow us on Social Media!

 @HCWAsia

 @hcwhasia

 @NoHarmAsia

Thinking of joining the **Global Green and Healthy Hospitals (GGHH) Network?**

Visit [greenhospitals.net](https://greenhospitals.net)

Want to learn more about **Sustainable Waste Management Practices** of our GGHH Hospitals?

Visit [bit.ly/LearnFromAsiaHospitals](https://bit.ly/LearnFromAsiaHospitals)

Want to set a meeting with us to help you manage and reduce plastics in your hospital?

Email [greenhospitalsasia@no-harm.org](mailto:greenhospitalsasia@no-harm.org)

---

Support the

## #breakfreefromplastic

visit Break Free From Plastic on Facebook

## JOIN OUR CALL TO

#EliminateHarmfulPlasticsInHealthcare

AND

#ProtectPublicHealth





Copyright 2019

Health Care Without Harm (HCWH) Southeast Asia  
Unit 203, Kalayaan Center Bldg., 65 V. Luna Road corner Kalayaan Ave.,  
Brgy. Pinyahan, Quezon City  
Manila, Philippines