
Health Care Waste Assessment Project

A partnership between
the Local Government Unit of Baguio,
Tertiary Hospitals in Baguio City and
Health Care Without Harm-Southeast Asia



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Executive Summary

In 2006, as part of Baguio City's move toward a cleaner and safer environment, a Waste Assessment and Characterization study (WACS) was conducted by the Solid Waste Management Association of the Philippines (SWAPP) in partnership with the City Environment and Parks Management Office (CEPMO) of Baguio City. The results of the study shall be the basis for identifying and evaluating alternative management schemes and technologies appropriate to the local government unit (LGU) and the basis for improving the LGU's service delivery on solid waste management. It will also serve as the framework for Baguio City's ten-year Comprehensive Solid Waste Management Plan.

Health Care Without Harm-Southeast Asia (HCWH-SEA) signified its interest in exploring possible partnership and providing assistance to the local government of Baguio in the issue of health care waste. CEPMO, represented by Engineer Nazita Banez, was interested in HCWH's campaigns and considered the possibility of obtaining baseline data of health care wastes generated by the hospitals in Baguio City. The baseline data will be made available through the conduct of health care waste assessments in the hospitals. It is a big step in identifying the gap in the city's Comprehensive Solid Waste management Plan.

In March 2008, CEPMO with five tertiary and 2 secondary hospitals in Baguio City and HCWH-SEA, formulated and signed a memorandum of understanding pertaining to the conduct of health care waste assessment project for the seven hospitals in the city. The project aims to:

- gather baseline information on the existing waste management procedures of all hospitals in the city of Baguio
- identify the types of health care waste generated per hospital
- draw up existing waste management systems and procedures with particular attention to good practices, as well as the problems encountered
- determine the actual costs of existing waste management systems in the hospitals under study
- provide recommendations to further improve health care waste management

Improper management of health care waste causes serious problems and poses significant risk to patients, health care workers, the community and the environment. Infectious waste from hospitals carry with them pathogens that, if not treated, can spread diseases inside the hospital and outside to the larger community. The safe and sustainable management of health care waste is therefore a serious responsibility of hospitals and an integral component of the operations of a health care system. It is also the responsibility of the government to allocate the necessary resources to develop, implement and monitor an appropriate health care waste management system which will ensure the safety of the health workers as well as the community.

A part of Baguio City's 2008 City Development Strategies states, "Adopt and integrate environment sensitive controls and mechanisms into the City's

development plans and policies to rehabilitate and revitalize the environment.” The local government has initially addressed its problems with both the solid waste and health care waste through the WACS and the health care waste assessment project which provided the baseline data for both the solid waste and health care waste.

The assessment conducted by HCWH-SEA shows that in a span of fifteen (15) days, the total waste generated by the seven hospitals amounted to 19,553.2 kilograms. Out of the total waste generated by the seven hospitals, 7,334.6 kilograms or 37% are non-biodegradable wastes which are placed in black trash bags, 7,364.3 kilograms or 38% are biodegradable wastes placed in green trash bags, 4,409.6 kilograms or 23% are infectious wastes placed in yellow trash bags and 444.65 kilograms or 2% are mostly sharps contained in improvised hard plastic containers.

The City of Baguio potentially generates a total of 9,708.5 kilograms of infectious wastes for the seven hospitals alone on a monthly basis. This translates to 116,502 kilograms of infectious wastes per year, 582,510 kilograms in five years and 1,165,020 kilograms of infectious wastes in 10 years. At present, the hospitals use chemical disinfection for the treatment of their infectious wastes while sharps and other infectious wastes are placed in their concrete septic vaults.

Chemical disinfection is not a sustainable method for the treatment of infectious wastes because of the hazardous effects of chemicals. Chemical disinfection poses risk to the health workers as well as to the environment. A safer alternative treatment technology is needed to address the treatment and final disposal of infectious wastes.

The volume of infectious wastes could be greatly reduced if proper waste segregation is being practiced in all the hospitals and orientation on proper waste disposal be given to patients and hospital personnel.

The following are the significant impact of the health care waste assessment project:

1. Provided baseline data on the types of wastes generated and current practices of the hospitals in managing their health care wastes.
 2. Raised the awareness of both the hospitals and the local government unit on the issue of proper waste management and environment and public safety.
 3. Opportunity for partnership/collaboration between hospitals, local government unit and non-government organization.
 4. Identified Alternative Technology for the treatment of Infectious Waste which is in compliance with the existing laws and regulations of the Department of Environment and Natural Resources (DENR) and the DoH.
 5. “A Clean and Environmentally Safe Baguio City in 2009”- Baguio City’s contribution for its Centennial celebration in 2009.
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I. Introduction

In 2006, a Waste Assessment and Characterization study (WACS) was conducted by the Solid Waste Management Association of the Philippines (SWAPP) in partnership with City Environment and Parks Management Office (CEPMO) of Baguio City. The study aimed to gather baseline data on waste generation, disposal, current waste management practices, and to make projections on waste generation, disposal and diversion. The results of the study were intended to become the basis for identifying and evaluating alternative management schemes and technologies appropriate to the city and also to improve the local government unit's service delivery on solid waste management. The findings from the WACS also became the basis for Baguio City's 10-year Comprehensive Solid Waste Management Plan.

It was also during this year, while documenting the use of Hoval incinerators in Baguio, that Health Care Without Harm-Southeast Asia (HCWH-SEA) signified its interest in exploring possible partnership and providing assistance to the local government of Baguio in the issue of health care waste management. HCWH already gained enough experience and further developed its expertise in providing technical assistance on health care waste management through its health care waste assessment projects with the four tertiary hospitals in Metro Manila in 2005 and one provincial and eight district hospitals in Northern Samar in 2007.

In 2007, HCWH-SEA was invited to give a presentation on health care waste management and alternative treatment technologies during the Annual Solid Waste Management Conference held in Baguio City. CEPMO, represented by Engineer Nazita Banez, became interested in HCWH's campaigns and considered the possibility of obtaining baseline data on health care wastes generated by the hospitals in Baguio city through a health care waste assessment.

CEPMO organized a Health Care Waste Generators Meeting in December 2007, which was attended by representatives from the Department of Health (DoH) and hospital administrators in Baguio City. In this meeting, HCWH-SEA had the opportunity to present its evaluation of the 2006 waste assessment and characterization study with special focus on hospital waste and other hazardous wastes. The WACS findings did not provide any data on health care waste, therefore, not enough basis on which to present solutions to the ever growing problem on health care wastes in Baguio City. Thus, HCWH-SEA proposed that a Health Care Waste Assessment be conducted in the major hospitals in Baguio City and the project be included as part of Baguio City's 10-year Comprehensive Solid Waste Management Plan.

In March 2008, the Baguio local government unit, through its CEPMO and five tertiary and two secondary hospitals in Baguio City and HCWH-SEA, formulated and signed a memorandum of understanding to conduct a health care waste assessment project of the seven hospitals in the city. The project aims to:

- gather baseline information on the existing waste management procedures of all hospitals in the city of Baguio



- identify the types of health care waste generated per hospital
- review existing waste management systems and procedures with particular attention to good practices, as well as to problems encountered
- determine the actual costs of existing waste management systems in the hospitals under study
- provide recommendations to further improve health care waste management

Improper management of health care waste can cause serious problems and pose significant risk to patients, health care workers, the community and the environment. The safe and sustainable management of health care waste is everyone's responsibility and should be an integral component of the national health care system. It is also the responsibility of the government to allocate the necessary resources to develop, implement and monitor an appropriate health care waste management system which will ensure the safety of the health workers as well as the community.

Baguio's 2008 City Development Strategies states that the city aims to "Adopt and integrate environment sensitive controls and mechanisms into the City's development plans and policies to rehabilitate and revitalize the environment." The local government of Baguio has initially addressed the city's problems with regard to both the solid waste and health care waste through the WACS and the health care waste assessment project which provided the baseline data.

Significance of the Project

Solid figures on health care waste in Baguio are not available. Meanwhile, problems of health care wastes and other wastes continue to grow not just in Baguio City but in other cities and provinces. Understanding the waste stream in a health care institution, as well as being able to identify the waste generated is crucial for proper waste management.

It is a great opportunity for the hospitals and the local government to collaborate and partner on something that is beneficial for the community, as health care wastes does not only affect those on the hospital premises but the public if not managed properly

Operating in Baguio are seven hospitals with a capacity of more than 800 beds. In its normal operations, each hospital would generate infectious wastes that if not managed and disposed properly would endanger not only the patients but the hospital workers and the public as well.

The results of the study conducted by HCWH-SEA will address the gap in the City's Solid Waste Management Plan with regard to health care waste management.

The results and recommendations from this study will be beneficial for the improvement of the health care waste systems and procedures of the seven hospitals under study.

The results and recommendations from this study will enable the local government unit of Baguio City and the Regional Office of the DoH to:

- determine their respective roles in managing both the solid wastes and health care wastes of the city
- identify possible alternative treatment technology appropriate for the city; and
- develop a monitoring system on health care waste management for Baguio City and also for the whole Cordillera Administrative Region (CAR).

Project Design/ Data Gathering Process

The project was divided into four stages to facilitate data collection and analysis.

Stage 1. Gathering preliminary data which included document review, interview with the hospital administrators and members of the waste management committee and preliminary walk-through in the hospital.

Stage 2. Validation of preliminary data gathered from Stage 1 and further validation through focus group discussions.

Stage 3. Final validation of data from Stages 1 and 2 through actual walkthrough assessments, and observing the waste management practices from waste collection, waste segregation, actual weighing of health care wastes, transport and final disposal

Stage 4. Collation and analysis of data gathered from Stages 1 to 3. Initial results are given in the form of case studies to all hospitals.

The seven (7) hospitals gave feedback on the initial findings. During the feedback sessions, researchers of HCWH-SEA had the opportunity to elaborate on the findings and recommendations for the hospitals. The final written report was revised based on to the feedback given.

A separate report for the Baguio local government unit through CEPMO will also be made available for reference to draw up possible solutions to the problems presented in the study.

The following are the partner hospitals for this project:

- Baguio General Hospital
 - Baguio Medical Center
 - BCU - Sto. Nino Jesus Medical Center Foundation, Inc
 - Fort Del Pilar Station Hospital
 - Notre Dame de Chartres Hospital
 - Pines City Doctor's Hospital
 - St.Louis University Hospital of the Sacred Heart
-

Partnership

Partner hospitals are responsible for providing the necessary logistics and manpower needed during the health care waste assessment, accommodation and meals of the researchers.

HCWH-SEA provided technical expertise and other information materials during the actual conduct of the health care waste assessment project. Accommodation and food expenses are also part of their counterpart for the project.

The Baguio-LGU through CEPMO provided resources for transportation, honorarium and other pertinent expenses stipulated in the memorandum of understanding and incurred during the actual health care waste assessment.

II. Findings of the Project

A. Waste Management Structure and Policies

All hospitals have their respective Waste Management Committee that plans, identifies different programs, and makes decisions on the implementation of policies and procedures on health care waste management.

Current Programs on Waste Management

Most programs of the Waste Management Committee are focused on waste minimization, specifically segregation, re-use and recycling of materials. One or two hospital staff members are requested to attend lectures/seminars on proper waste management, which are shared and re-echoed to other hospital staff members during monthly departmental meetings.

Waste Management Policies and Procedures

The waste management committee also sets policies on accident reporting specifically injuries due to improper waste disposal of sharps. Most of the hospitals refer to the DoH's Health Care Waste Management Manual for the standard guidelines in setting up their waste management system.

B. Waste Management System

1. Observed Practices for Waste Collection, Segregation, Re-Use, Recycling and Inventory System

a. Segregation and Collection

All hospitals have three shifts for waste collection--7:00 a.m. to 3:00 p.m.; 3:00 p.m. to 11:00 p.m. and 11:00 p.m. to 7:00 a.m. All health care wastes are collected from the different departments of the hospital. Assigned waste collectors are usually members of the housekeeping department.

Majority of the hospitals follow the standard color-coded trash liners/bins for segregation of their wastes. The bins are strategically located in the different areas of the hospital. The following are the classification of wastes:

Type of Wastes	Trash Liners/ Bins
Non-biodegradable, non-infectious, dry wastes	Black
Biodegradable, non-infectious, wet wastes	Green
Infectious and Pathological Wastes	Yellow
Sharps	Sharps container (standard or improvised)
Used ampoules and vials	Hard Plastic container

Posters for proper waste segregation are available and usually located on top of the trash bins. These also serve as information, education and communication (IEC) materials for patients to inform and remind them on proper waste segregation.



A specially designed trash bin (left) with pictures and labels of types of wastes.

Improved containers for used syringes and sharps.



Trash bins with color-coded liners and labels

b. Re-Use and Recycling of Materials

Majority of the hospitals promote waste minimization through reduction, reuse and recycling. Extra income and savings are generated from recycling, while reuse of some supplies (i.e. cartons being reused as splints or medicine trays, hard plastic containers of disinfectants being reused as improvised sharps containers, plastic bottles and aluminum cans sold to recyclers, reuse of paper, reuse of ink cartridges) yields enough savings for the hospital.



Recycled materials serve different uses (Clockwise from top left): an old toilet bowl and styrofoam packaging serve as plant boxes; cooking oil cans as water containers; and boxes as chart organizers.



c. Inventory System

Each hospital has an effective inventory system employing the “first in, first out” (FIFO) policy for both pharmaceutical and medical supplies. All hospitals have a “return policy” stipulated in the bidding/ purchasing contract for both pharmaceutical and medical supplies. Distributors/ manufacturers take back the nearly expiring supplies and either replace it with new ones or deduct the value of the old expiring supplies from the new purchase order.

2. Observed Practices for Waste Storage System

All hospitals have designated waste storage areas for temporary storage of biodegradable, non-biodegradable and infectious wastes. But most of them do not have proper signages and the area is also usually accessible to unauthorized persons. Appropriate locks should be installed.

Standard specifications/ requirements for setting up the storage area should strictly follow the Health Care Waste Management Manual of the DoH.



Two types of storage areas for hospital waste.

3. Observed Practices for Waste Documentation System

Most of the hospitals do not have systems for documenting the health care wastes generated. Monitoring of compliance to proper segregation and waste disposal are discussed during monthly staff/department meetings.

During the assessment, HCWH-SEA recommended that the hospitals make their own monitoring of the actual amount of wastes generated on a weekly basis. Most of the hospitals submitted the results of a two-week monitoring of their health care wastes.

One hospital was able to monitor the monthly cost of chemical disinfectant used per kilogram of collected infectious wastes.

4. Observed Practices in Processing, Transport and Disposal of Health Care Wastes

Hospitals that participated in the study have their own system of waste processing and treatment. Majority of the hospitals make sure that all infectious wastes are treated with chemical disinfectants prior to final disposal. Chemical disinfectants that are being used are sodium hypochlorite and benzalkonium chloride, commercially known under the brand names of Zonrox and Lysol, respectively.

Most of the hospitals used improvised carts to collect and transport of health care wastes to the designated storage area. Some hospitals that do not have wheeled carts usually carry the double-lined trash bins to the temporary waste storage area. This practice is improper especially if infectious wastes are being transported.



Non-biodegradable waste and recyclables are regularly collected by the local government/ municipal office. Biodegradable wastes such as food wastes are made as hog feed. Infectious wastes are put into the hospital's labeled septic vault. Some hospitals have separate septic vault compartments for sharps and for other infectious wastes. Other hospitals have only one septic vault intended for both infectious wastes and sharps.



Chemically-treated infectious wastes are collected by the municipal dump truck labeled as residuals.



5. Safety Practices on Waste Management

All the hospitals provide only latex or laundry gloves and simply cloth masks as protective equipment for waste handlers/collectors.

Most of the waste collectors are more comfortable in segregating health care wastes by using their gloved hands than using tongs or forceps. Through this practice waste collectors are at risk of injuries from improper disposal of sharps.

HCWH researchers also observed that waste collectors and other housekeeping personnel have no uniform. Instead they wear their street clothes and shoes during their hospital duty. It is therefore recommended that housekeeping personnel should have a unique set of uniform to be worn while performing their duties. This can help minimize the risk of acquiring or transmitting infectious diseases in the course of their work.



Waste collector (above) wearing proper protective gear: mask, heavy duty gloves and cover-all

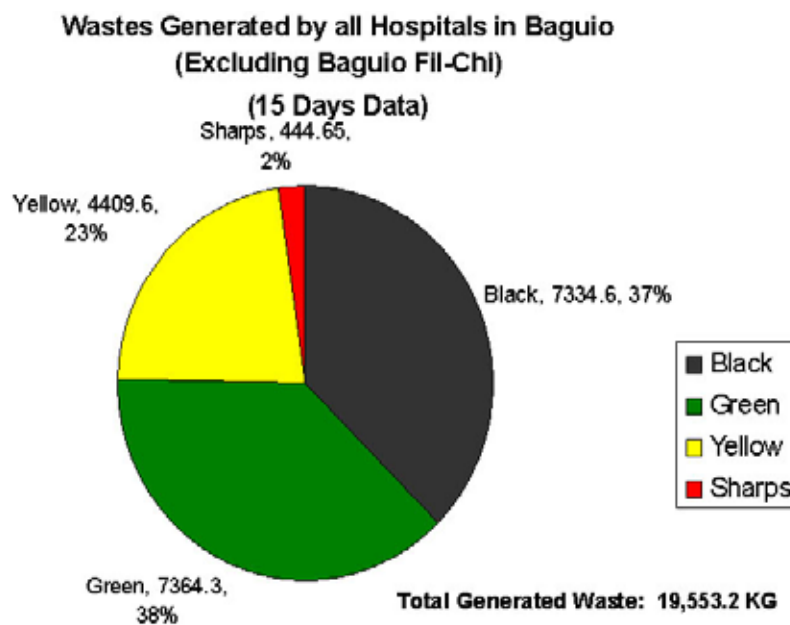


One hospital has a needle destroyer/burner in every ward but nurses and other hospital personnel do not want to use the equipment due to the fumes that it emits during actual burning/destroying of sharps. Proper use of the needle destroyer should have reduced the amount of sharps being disposed.

6. Types of Wastes Generated

Types of health care waste generated by hospitals greatly depend on the number of patients served and the bed capacity of the hospital.

The pie chart below shows the types of health care wastes generated by the seven hospitals in a span of 15 days. Out of the 19,553.2 kilograms total health care waste generated by the seven hospitals, 7,334.6 kilograms or 37% are nonbiodegradable wastes which are placed in black trash bags, 7,364.3 kilograms or 38% are biodegradable wastes placed in green trash bags, 4,409.6 kilograms or 23% are infectious wastes placed in yellow trash bags and 444.65 kilograms or 2% are mostly sharps contained in improvised hard plastic containers.



Extrapolating from the findings of the study, the City of Baguio potentially generates a total of 9,708.5 kilograms of infectious wastes on a monthly basis from the seven hospitals alone. The figure is 116,502 kilograms of infectious wastes in one year, 582,510 kilograms in five years and 1,165,020 kilograms of infectious wastes in 10 years. At present, the hospitals use chemical disinfection for the treatment of their infectious wastes while sharps and other infectious wastes are placed in their concrete septic vaults. Chemical disinfection is not a sustainable method for the treatment of infectious wastes because of the hazardous effects of chemicals and may pose risk to the health workers as well as to the environment. Thus, chemical disinfection should be discouraged. A safer alternative treatment technology is needed to address the treatment and final disposal of infectious wastes.

The volume of infectious wastes could be greatly reduced if proper waste segregation will be practiced in all the hospitals and orientation on proper waste disposal given to patients and hospital personnel.

7. Staff Development / Education Program on Waste Management

Most of the hospitals have no regular staff development sessions or education program on waste management. One or two hospital staff members are sent to lectures, seminars or conferences on health care waste management; and they are expected to share or re-echo the important information on waste management to the other hospital personnel during monthly staff meetings.

No orientation on proper waste disposal is being given to newly hired hospital staff or hospital interns.

Although information materials on proper waste disposal are readily available, most of the hospital personnel still lack the knowledge and awareness on this issue.

Requests for information materials and seminars or trainings on health care waste management were some of the common issues raised during the focus group discussions.

III. Impact of the Project

The health care waste assessment project in Baguio City was able to attain the following:

1. Provided baseline data on the types of waste generated, and current practices of the hospitals in managing their health care wastes.

The WACS conducted in 2006 did not provide any data on health care waste. To close the gap, the HWAP collected baseline data on the volume and types of health care wastes generated by seven (7) major tertiary hospitals in Baguio City. It also projected the amount of infectious waste that could be generated within five (5) to ten (10) years if waste minimization strategies such as segregation, reuse and recycling will not be implemented. The HWAP also highlighted the current practices of the seven (7) hospitals in managing their health care wastes through various waste minimization initiatives and also following the standards set by the DoH.

The findings from both the WACS and HWAP projects completed the waste stream picture of Baguio City covering both the solid wastes and health care wastes and provided a reliable basis for the implementation of Baguio City's 10-year Comprehensive Solid Waste Management Plan.

2. Raised the awareness of both the hospitals and the local government unit on the issue of proper waste management and environment and public safety.

The results of the assessment raised the level of awareness of hospital personnel, hospital administrators and officials of the local government unit on the harmful effects of improper disposal of health care wastes. Through interviews and focus group discussions, health care workers are made aware of the hazardous effects of polyvinyl chloride (PVC) and mercury. The hospital reports contain a detailed description of the current practices on health care waste management. Through the recommendations given by this report the seven hospitals can further improve their waste management procedures and systems.

The local government unit will be able to appreciate the current practices and waste management systems of the hospitals and understand the problems encountered by the tertiary hospitals regarding the treatment and final disposal of infectious wastes.

3. Opportunity for partnership/collaboration between hospitals, local government unit and non-government organization.

The partnership between the local government unit, the tertiary hospitals and HCWH-SEA can serve as a model for multi-sectoral collaboration in addressing a significant component of environment preservation and sustainability, particularly on the issue on proper management of solid and infectious wastes.

The participation and involvement of the different stakeholders in addressing an important issue which will greatly benefit the whole city is an indication of good governance

4. Identified Alternative Technology for the treatment of Infectious Waste which is in compliance with the existing laws and regulations of the DENR and DOH.

Inspection of the hospitals' operations with regard to their medical waste management revealed that the hospitals are currently using chemical disinfection to treat their waste prior to final disposal. While chemical disinfection is accepted, this is not the optimal solution as it offers a lower level of disinfection and has been recognized as a source of occupational hazard for hospital personnel. For these reasons, the DoH waste management manual only recommends chemical disinfection for hospitals where no treatment facilities exist.

The assessment project has identified and recommended Baguio's possible use of autoclave machines for the treatment of medical waste prior to final disposal in a landfill. Given the volume of medical waste generated by the city and the size of hospital operations, a centralized waste treatment facility is needed to service the needs of the city's hospitals.



Autoclave used for sterilizing reusable medical equipments and other medical and laboratory supplies.

5. "A Clean and Environmentally Safe Baguio City in 2009"—Baguio City's contribution for its centennial celebration in 2009

Recent developments in the city, which brought greater attention on waste management as an urgent issue, are calling for a constituency that is aware of waste management problems and supportive of efforts to seek solutions. Finding solutions for medical waste management should be a part of any comprehensive waste management plan for Baguio City. Since medical waste is a very small portion of the larger waste stream in the city, making positive improvements in medical waste management should be the easiest.

Because of the medical profession's oath to safeguard human health and not be a source of harm to people, reforming medical waste management practices should meet the least resistance, if any, from the hospitals. Once the hospitals have been brought onboard the city's campaign for an environmentally safe Baguio City in 2009, the medical community would be an extremely useful champion to push for further improvements in the environment of the larger city in time for the city's centennial in 2009.



Health Care Without Harm (HCWH) is an international coalition of 473 organizations in more than 50 countries, working to transform the health care industry so it is no longer a source of harm to people and the environment.

In the Philippines, HCWH South East Asia has laid the groundwork for promoting its three main issues on environmentally responsible health care: best practices in health care waste management, mercury-free health care, and alternative technologies to incineration of medical wastes.

In the five years that HCWH South East Asia has been in the country, it has done high profile projects such as the documentation of the proper disposal of needles and syringes used in the DOH Philippine Measles Eradication Campaign in 2004, the Health Care Waste Assessment Project in Four Tertiary Hospitals in Metro Manila in 2005 and the hosting of the first ever Southeast Asian Conference on Mercury in Health Care in early 2006.

HCWH Southeast Asia has been visibly promoting its causes through seminars, conferences, and training programs, and has made several contributions to various published material concerning its key environmental issues. Most notably, HCWH is cited as one of the contributors to the creation of the Philippine Department of Health's Health Care Waste Management Manual.

Health Care Without Harm-South East Asia

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