

Project documentation

SDG School 2023

Project identity

PRESET

Team members

Pictures, key skills and team roles

Ishita Agrawal - Marketing and branding communication, research

Sanchita Chapagain - Development Practitioner

Govardhan Pinni - financial analysis, consulting



Introduction

Lack of awareness about the environmental impacts related to health-care waste, inadequate training in proper waste management, absence of waste management and disposal systems, insufficient financial and human resources and the low priority given to the topic are the most common problems connected with health-care waste.

Of the total amount of waste generated by health-care activities, about 85% is general, non-hazardous waste. The remaining 15% is considered hazardous material that may be infectious, toxic or radioactive.

This project only deals with one kind of **general or non-hazardous waste** i.e. medicine strips or tablet blisters. The general or non-hazardous waste is usually the waste that does not pose any particular biological, chemical, radioactive or physical hazard. Among the major sources of health care waste, nursing homes for the elderly or old age homes are also one of the source points for this type of waste generation.

About 90% of the seniors in India (60+ year old) are using atleast 1 prescription drug. This compounds to huge amount of medicine strips waste yearly by one single person. Keeping in consideration this huge amount of medicine strips generated, the problem of this waste ending up in landfills and dumping sites is a matter of concern since the strips or packaging is usually made of aluminum and plastic which are difficult to recycle.

In this project, we aim to collect and resue blister packs and aluminum packaging of medicines. A blister pack is any of several types of pre-formed plastic packaging used for small consumer goods, foods, and for pharmaceuticals. Push through blister packs are the standard type of packaging used today for drugs in tablet form. The primary component of a blister pack is a cavity or pocket made from a formable web, usually a thermoformed plastic. This usually has a backing of paperboard or a lidding seal of **aluminum foil or plastic**. A blister that folds onto itself is often called a clamshell.



Material	PVC and Aluminum
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Thickness	5mm
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Problem Statement

What who why & where

What -

As a society we have understood managing kitchen waste and bio medical waste but there is no proper disposal of medicine strip waste (aluminum and plastic) currently and no productive upcycling use of the same.

Who -

We solve the problem at the source. Senior citizens consume about 2 medicines daily which annually creates huge amount of medicine waste. Repurposing and upcycling of such waste would ease the waste management process , thereby making it easier for waste managers.

Why -

The medicinal strips waste includes both aluminum and plastic components and there is no proper recycling facility available currently. By making it into tangible usable items, we would prevent it from filling the landfills and damaging the environment.

Where -

Collecting it primarily from old age homes/senior residential places and apartment society because of the quantum of medicine strips/tablet blisters being produced.

SDG in focus

SDG Goal 12 Responsible Production and Consumption

SDG Goal 11 Sustainable Cities and Communities (in the long run, this project and its proposes solutions will be in line with this goal)

Process and motivation

How did the project come to life? How does it match your skills and motivation?

Considering the amount and types of waste around us, we as a team could empathize with the problem of waste management and different components of waste that are difficult to recycle and there is hardly any option available to put them for reuse. One fine morning while talking to our grandparents, we realised that while they seem to be most organised folks, when it comes to medicines they are always anxious to find the right medicine from the hoard of medicines they have. It's mostly disorganised and creates a lot of waste too.

We realised that we are creating a whole lot of plastic waste by irresponsibly throwing away these medicine strips. We also explored that the recycling process of this kind of waste is quite difficult.

Therefore, thinking around this problem, we came up with the information of the major sources from where this waste is mostly generated and we then focused on the old age homes in India. As a team, we developed the mutual understanding on the importance of this problem and started to work on it.

Statistical data

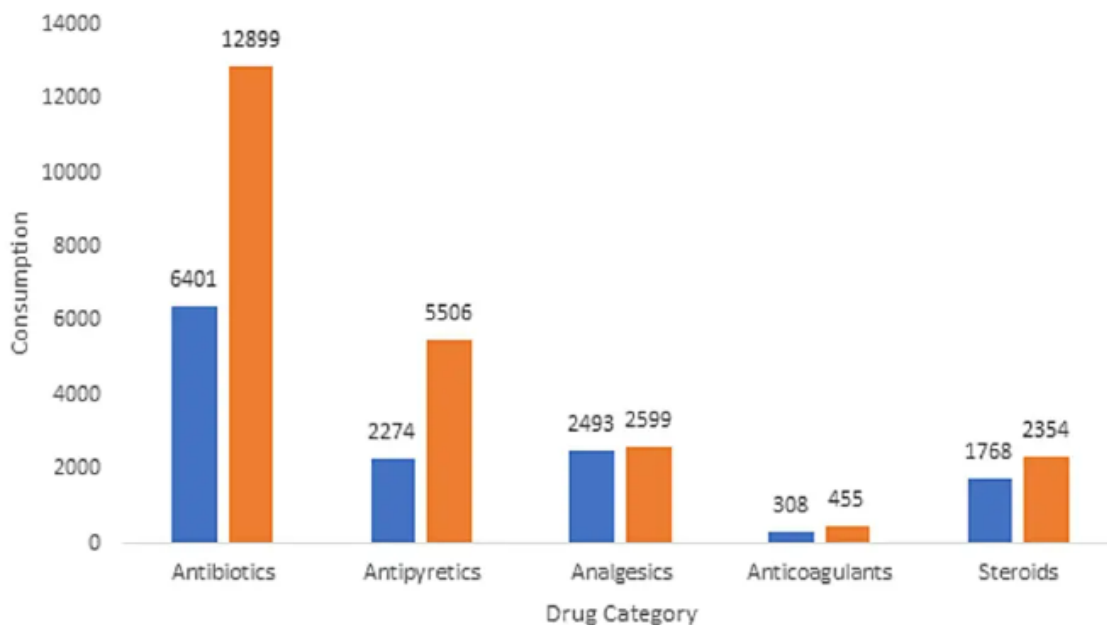
User persona, data collection

About 90% of the seniors in India (60+ year old) are using atleast 1 prescription drug. This compounds to huge amount of medicine strip waste yearly by one single person.

Based on our conversation with a old age home in Jaipur- Old Age Homes: On an average one senior citizen generates over **~70 strips** for one medicine annually. (40 residents *70 = **2800 strip per old age home**)

Similarly, An apartment society having 1000 people, and 50% of them using medicine, would produce **20,000 strips per annum**, and there is currently no process to dispose or recycle the strips which contain plastic and aluminum.

After COVID-19 pandemic the consumption of medicines has increased multifold.



■ Average monthly Consumption in Pre-Covid Period (2019)
■ Average monthly Consumption during Covid Period (2020)

According to WHO, there are different types of medical wastes as follows:



Infectious waste



Hazardous waste



Radioactive waste



General waste

Of the total amount of waste generated by health-care activities, about 85% is general, non-hazardous waste. The remaining 15% is considered hazardous material that may be infectious, toxic or radioactive.

The general waste may also be referred to as either municipal or domestic and is similar to household waste. It is not hazardous and the materials placed in this stream are usually disposed of in landfill sites.

Prototypes

Documentation divided by iterations (Pictures / code / drawings / text)

Prototype#1 (Made of PVC plastic) “Preset Organizers”

- Hypothesis - An organized and customizable organizer storage for the purpose of storing medicines making it easier for specially the old aged people
- Experiment - Finger joinery adjustable medicine box with sections which can be adjusted as per need

- Results / learning - Easy and simplified storage of medicines making the process of consumption easy

Prototype #2 (Made of Aluminum) “Shelter Sheets”

1.1 For Emergency

- Hypothesis - Thin and light weight sheets used for building temporary shelters for people and communities in case of emergencies and crisis like floods and earthquakes.
- Experiment - Flattening of separated aluminum
- results / learning - Weather resistant and heat resistant

1.2 Portable Stray dog shelter

- Hypothesis - Stray dogs live a life full of challenges. They don't get shelter even in the worst scenarios like rains. We often hear news about dog abuse whenever they seek shelter against rains in a private property. With a small house made from water resistant blister packs (medicine strips) they can give themselves a safe shelter in rains and other such weather conditions.
- Experiment- Flattening of separated aluminum to create sheets
- Results / Learning - Preferable for creating shades and resting space

Field study / user testing

Testing the project/service with users in a specific community

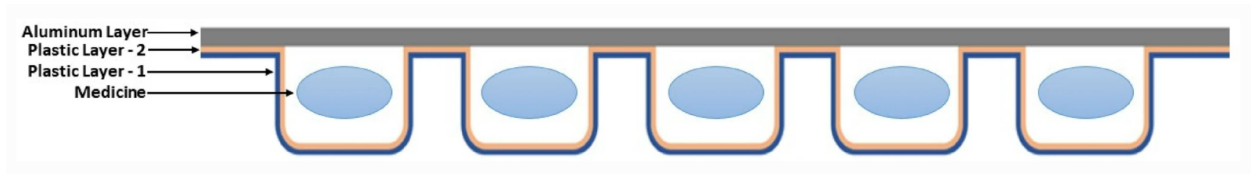
1. Interaction with the owner of Jeevan Jyoti Old Age Home, Amer about the problem of medicine waste being created and found out that there is no basic solution for waste management in the area
 2. Email and Whatsapp Interaction with Suny Group - A Chinese recycling machineries manufacturer which has machineries related to recycling of blister packs
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Final product/service results

Pictures / and text summary

Phase 1

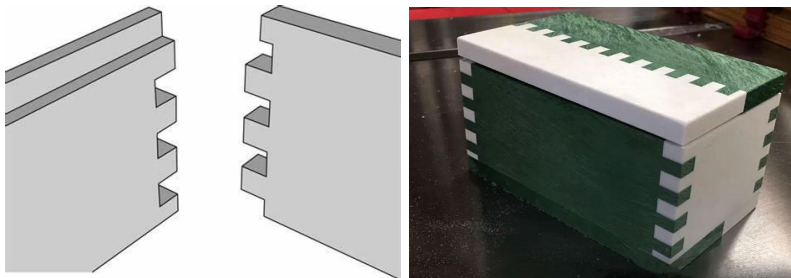
We have two materials as our raw materials- plastic and aluminium foil. We set up manual segregation and sterilisation systems to remove plastic from the foil.



Once we have the plastic- it goes into a shredder to form mini pieces which can then be processed through a heat press and formed into plastic panels.



We cut the panels using finger joinery system to form plastic boxes.



These plastic boxes work as medicine storage and organisers for senior citizens and in households.

Phase 2

The other product from our waste collected is aluminium foil and aluminum med packs.



With its growing population and demand for shelters, aluminium is one of the products that is gaining acceptability in the country.

Regardless of the type of building structure, it fits into all, which makes it lucrative from a business angle.

Aluminium fabrication comes in different types of frames and fittings. Items like doors, windows, staircases, handrails, supports and corridors have become accepted features in most modern buildings. Aluminum is environmentally effective as it is one of the easiest metals to recycle. It takes only about 5% of the energy to recycle aluminium as compared to what is used in making primary aluminium. It can be recycled indefinitely without losing any of its properties. This makes aluminium one of the most environment-friendly materials to work with.

We propose manufacturing aluminium sheets to be used as shelter roofs for stray dogs. We work in partnerships with animal welfare board and animal hospitals to identify touchpoints and creating safe shelters for these animals.



Business Model Canvas

Scale up plan of the solution and basic financial modeling

StoryTelling/Communication narrative

Communication tools to tell your solutions story

- Face to face interactions
 - Multi media
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Open House review

Key learnings and feedback received from jury members.

- Obtaining the information about the technology and the machineries required for creating the proposed solutions.
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Takeaway

Why did you learn and what would you recommend for next teams?

The main learnings from the open houses session was to look at our project from the point of view of learning more about the problem and finding the possibilities of putting the material to its best use.

Reference

<https://www.huhtamaki.com/en/pushtab/>

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<https://leadership.ng/investing-in-aluminium-fittings/#:~:text=With%20its%20growing%20population%20and,type%20of%20frames%20and%20fittings.>

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<https://www.syntegon.com/solutions/food/paper-forming-technology/#downloads>

Video Links

<https://www.youtube.com/watch?v=JjAxLrIAZ1I&t=44s3>

Case study points-

The pharmaceutical industry in India was valued at an estimated US\$42 billion in 2021. India is the world's largest provider of generic medicines by volume, with a 20% share of total global pharmaceutical exports.

India is the 3rd largest producer of medicine in the world and it also the largest provider of generic medicines globally.

Hyderabad – The Pharma Hub of India.

It accounts for 40 per cent of the total Indian bulk drug production and 50 per cent of the bulk drug exports and is considered as the 'Bulk Drug Capital of India'.

India is likely to generate about 775.5 tons of medical waste by 2022..

About 80% bio medical waste is non-hazardous waste which contains plastic packaging, bottles etc.

plastics are made from fossil fuels, are breeding grounds for vector borne diseases, block and break sewage systems, suffocate wildlife, leak toxic products into water ways and into the air when incinerated or burned. Plastics have also been linked with severe adverse health outcomes, such as cancers, birth defects, impaired immunity, endocrine disruption, as well as developmental and reproductive effects. As such, plastics deserve special attention.

Estimates of absolute volumes of plastics in healthcare waste are hard to find but volumes can be assumed to vary between parts of the world and levels of healthcare. WHO describes 75%–90% of health waste to be ‘non-hazardous’ or ‘general waste’, of which more than half consists of paper, cardboard and pl...

<https://innovations.bmj.com/content/early/2022/09/14/bmjinnov-2022-000986>

Of all medical plastics, around 12% are reported to be incinerated
paper blister packaging being done-

similar use case scenario- Besides vetting innovations in the future, identifying safe alternatives for problematic products in use is not a straightforward process. A case in point are reusable silicone menstrual cups. These have long been demonstrated as being the environmentally friendly alternative to plastic based sanitary towels, as well as safe, cheaper and last longer.⁴¹
⁴² A single menstrual cup does away with ten years’ worth of alternative products.