



# Thriving Together: Advancing Health and Well-Being in Southeast Asia

A platform dedicated to improving health and well-being across Southeast Asia through the development of an app with innovative, user-centric applications!

**Team D&J Data Detectives**  
National University of Singapore



Lee Weng Heng, Jon

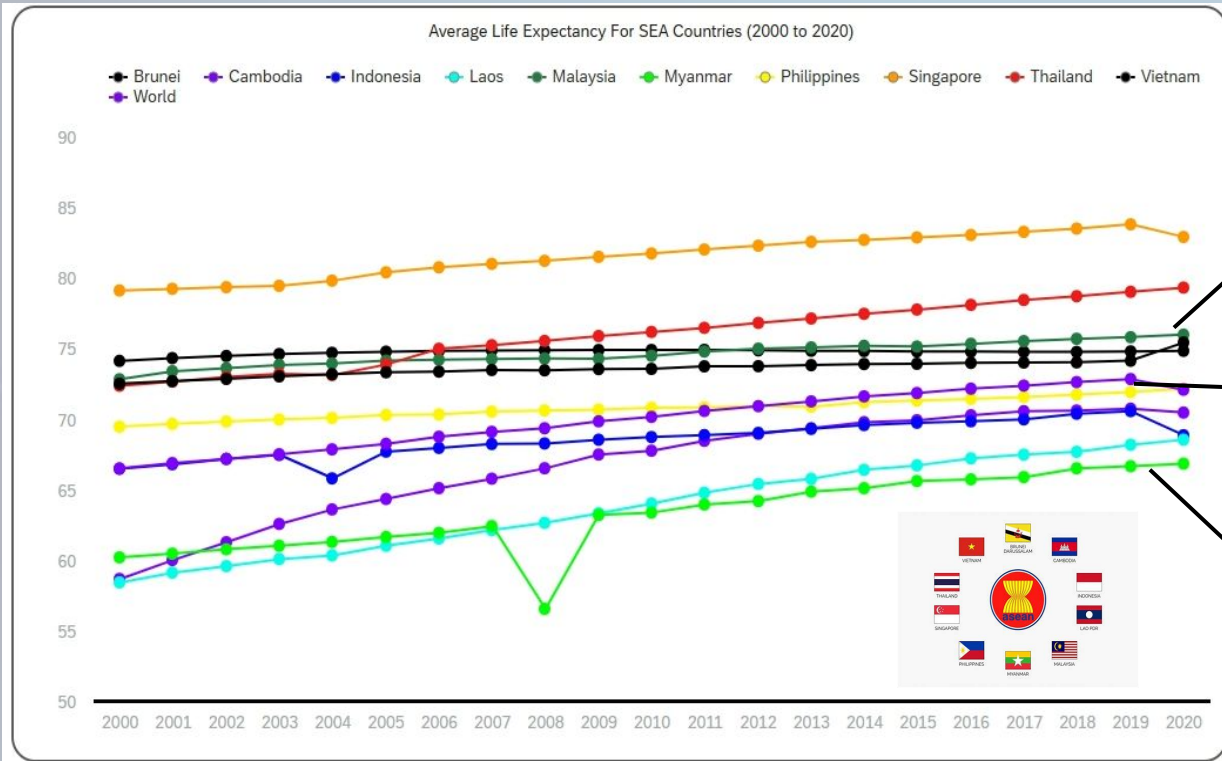


Tan Teck Hwe Damaen



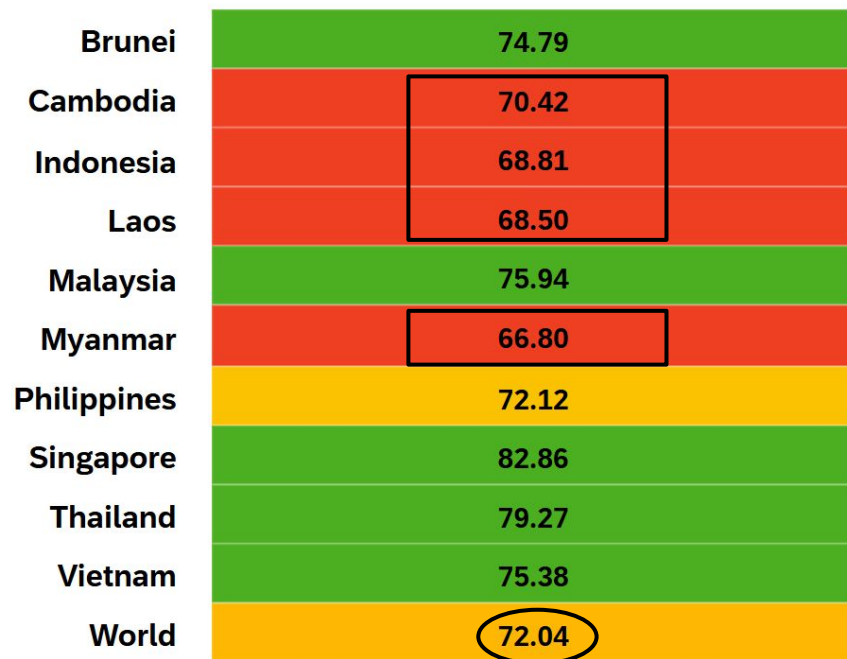
# Problem: Below Average Life Expectancy In ASEAN

Line Chart: Average Life Expectancy in ASEAN (2000 to 2020)



# Life Expectancy of ASEAN countries in 2020 (Heatmap)

Average Life Expectancy For SEA Countries In 2020



The following countries have life expectancies below the world average.



Cambodia



Indonesia



Laos



Myanmar



**URGENT!!**

# Why lower than average life expectancies in ASEAN?

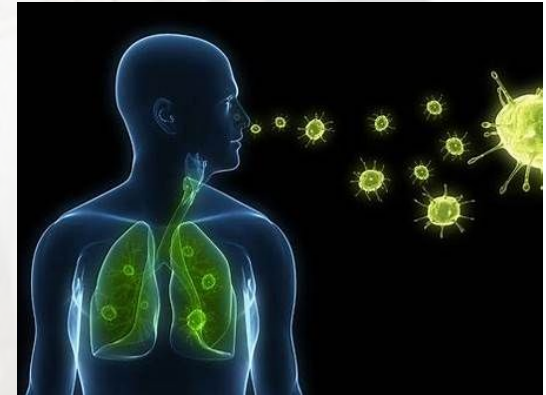
**Lack of Safe Sanitation**



**Widespread Transmission of Diseases**



**Insufficient Resources spent on Healthcare**

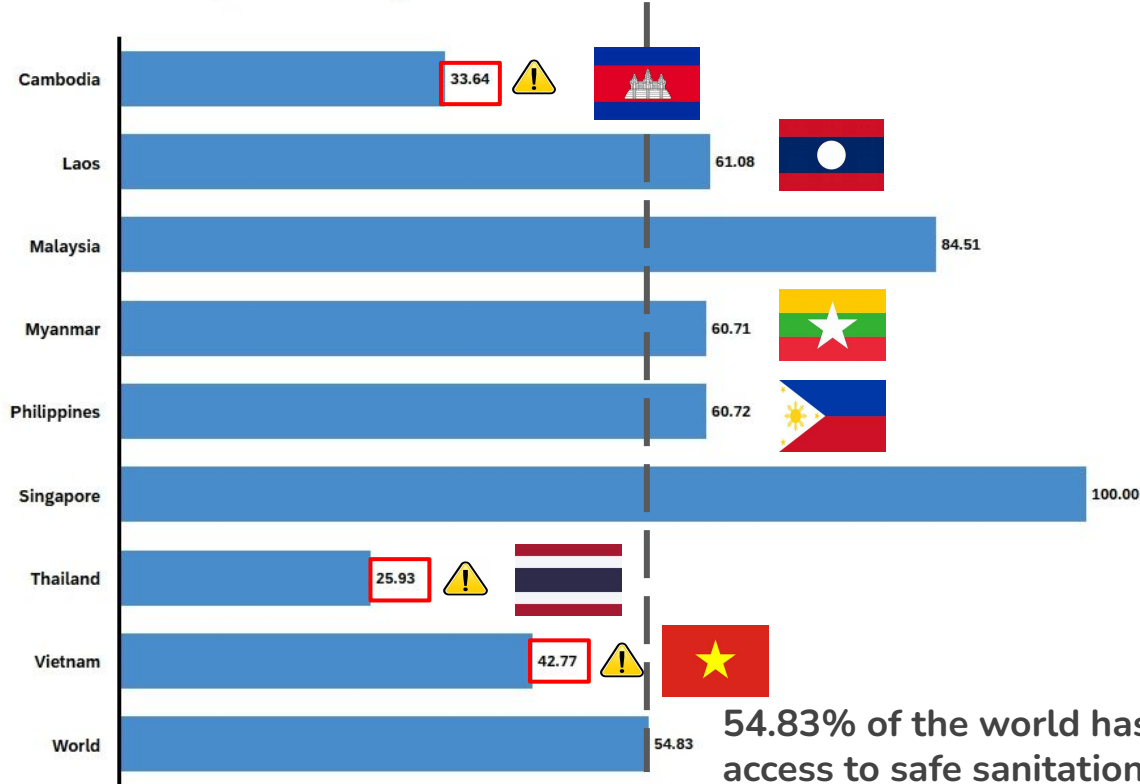




# Problem 1: Lack Of Safe Sanitation (Bar Graph)



Population Percentage With Safe Sanitation For Several SEA Countries In 2020



Much lower safe sanitation rates in Cambodia, Thailand and Vietnam compared to world average of 54.83%.

About 2 in 5 people being exposed to unsafe sanitation in Myanmar, Laos and Philippines.

**CAUSE FOR CONCERN**

# Possible Reasons For Lack Of Safe Sanitation

**Rapid urbanisation  
affecting water quality  
and cleanliness.**



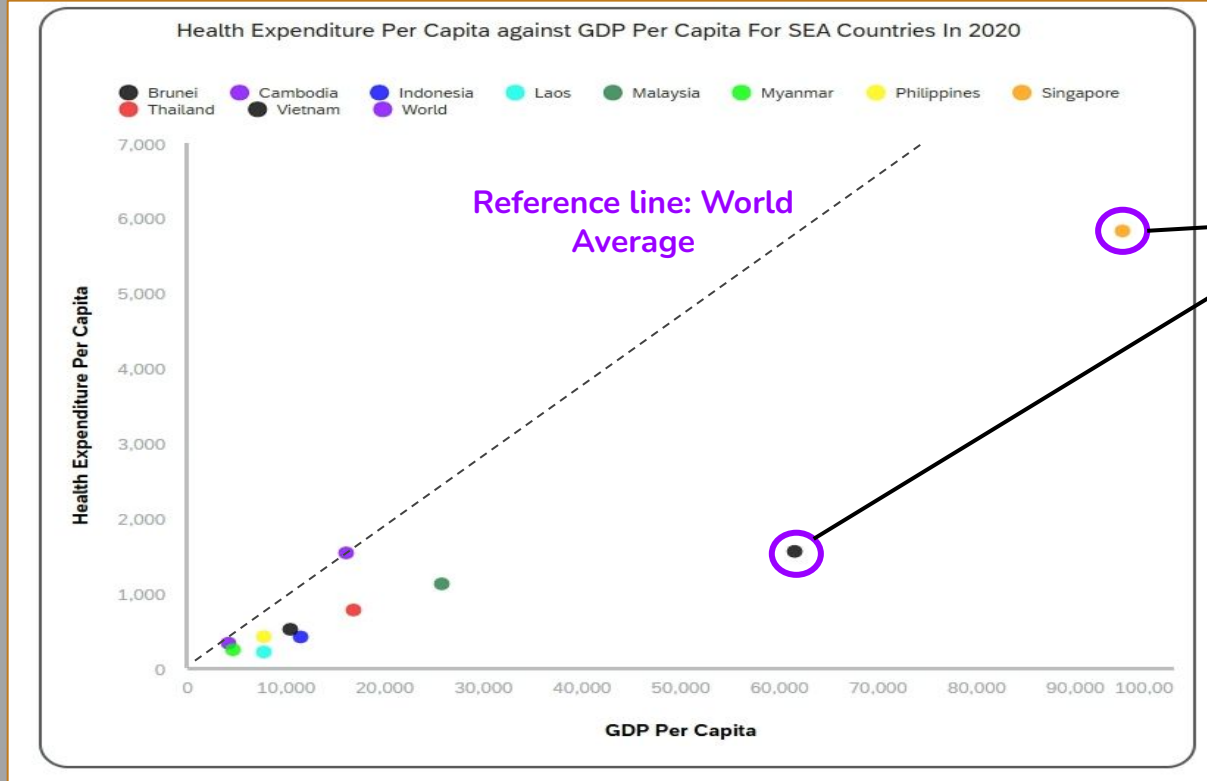
**Poor access to clean  
water for people in  
rural areas.**



**Insufficient  
government funds  
for drinkable water.**



## Problem 2: Insufficient Resources Spent On Healthcare (Scatter Plot)



All SEA countries lie below the reference line

Brunei and Singapore have the most severe lack of healthcare expenditures

Insufficient monetary resources spent on healthcare compared to world average

**CAUSE FOR CONCERN**

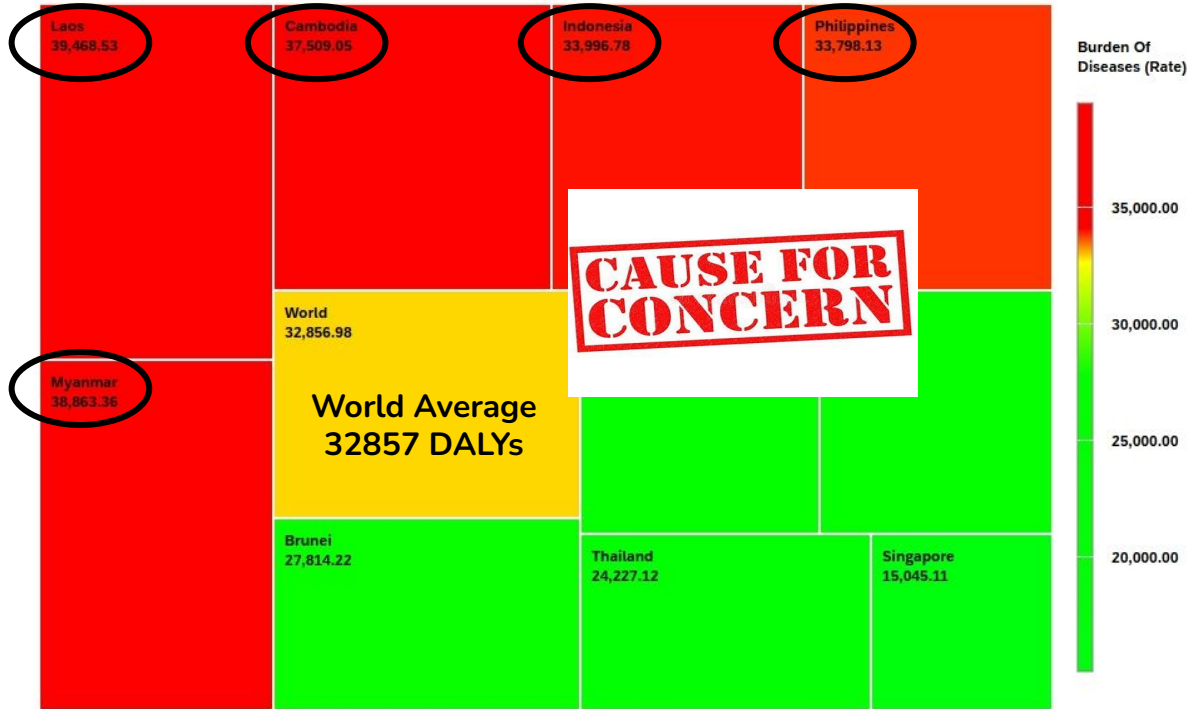






# Problem 3: Widespread Transmission Of Diseases

Burden Of Diseases (Rate) For SEA Countries In 2019



The following countries have higher than average disease transmission levels:



Cambodia



Indonesia



Laos



Myanmar



Philippines

\*Rate refers to DALY (Disability-Adjusted Life Years) per 100,000 individuals.  
One DALY equals to 1 lost year of healthy life of an individual.

# Possible Reasons For Higher Disease Transmission Levels

**Lack of proper hygiene and sanitation practices, especially in rural areas**



**Consumption of raw or undercooked food, especially in countries with street food**



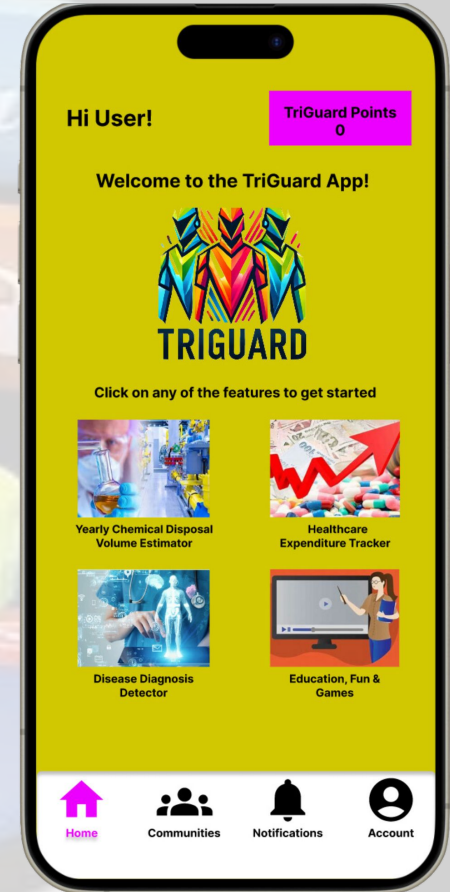
Time is of essence!  
We must act fast and find a way to solve  
these persistent problems in ASEAN!

Presenting...

# TriGuard



Our high-fidelity prototype app





# Why TriGuard?

TriGuard has three different features that act as shields to tackle the three problems identified related to SDG3.



**Yearly Chemical Disposal  
Volume Estimator**

to tackle...

the lack of safe  
sanitation



**Healthcare  
Expenditure Tracker**

to tackle...

insufficient resources  
spent on healthcare



**Disease Diagnosis  
Detector**

to tackle...

higher disease  
transmission levels

# Feature #1: Yearly Chemical Disposal Volume Estimator

Industries separated into sectors



Calculate volume of chemicals discarded for each sector



Identify sectors where most chemicals are discarded



Government takes action to reduce chemical disposal in these sectors





# Feature #2: Healthcare Expenditure Tracker

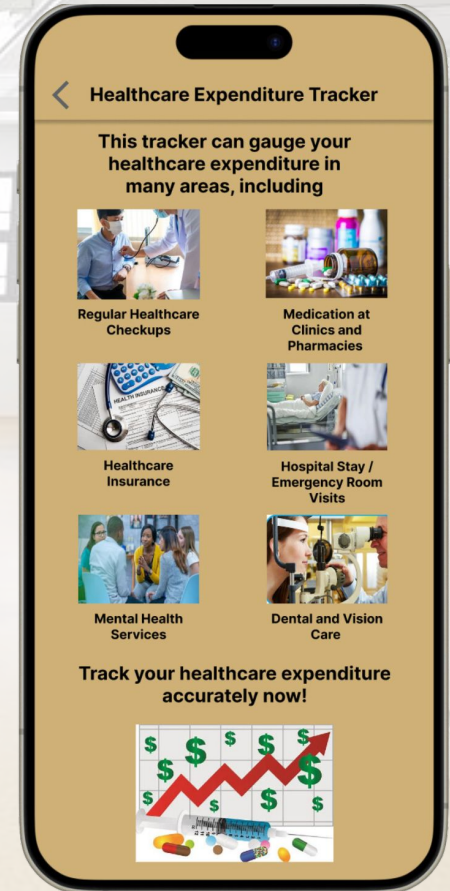
User scans receipts and app automatically categorizes expenditures through Optical Character Recognition (OCR)

Healthcare expenditure calculated and app gauges whether user is spending enough based on their profiles



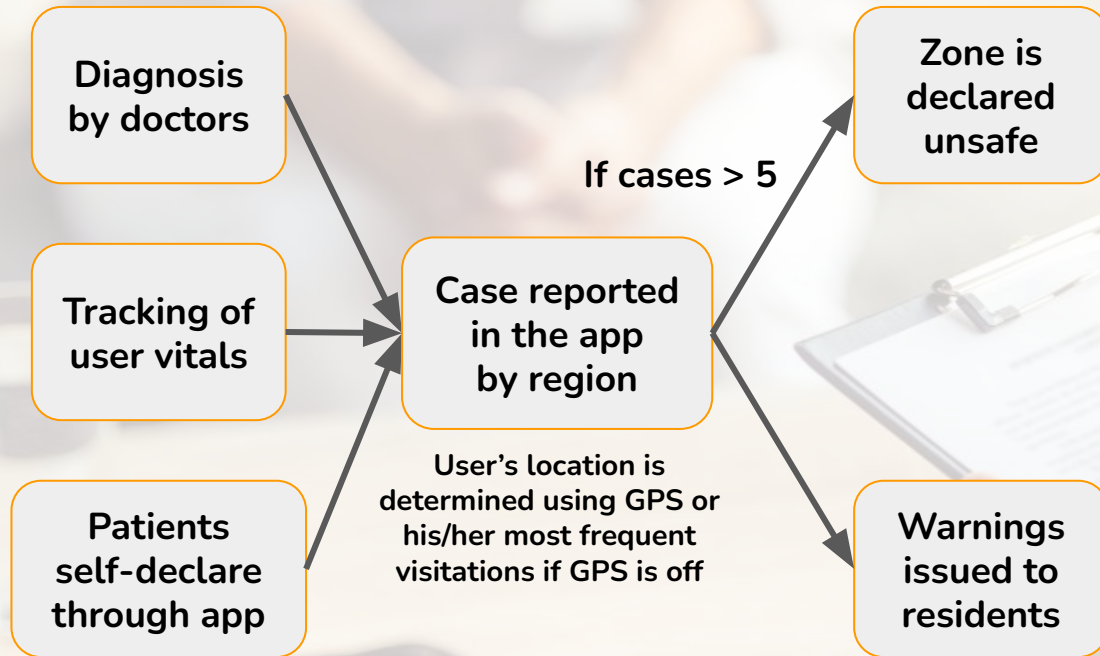
Government incentivise citizens to increase healthcare spending

Government alerted if many users spend inadequately on healthcare.





# Feature #3: Disease Diagnosis Detector



## Extra Feature: Enjoyable Education - Engaging, Entertaining, Enlightening



**Online tutorials**



**Informative statistics**



**Mini quizzes**



**Games and activities**



**Simulations**

# How TriGuard benefits stakeholders

- Better identify and track industries' chemical activity
- Tracking of disease clusters



Government

- Encouraged to go for regular health check-ups
- Increased knowledge on health, diseases and sanitation

Individuals



Industry

- Incentives to reduce chemical disposal
- Use more environmentally friendly materials for production

Society

- Better overall health and well-being
- Less disease transmissions due to heightened awareness





# More Detailed Screenshots and Images of TriGuard App

## Feature 1

### Disease Diagnosis Detector - Help To Track The Number Of Cases Of Diseases In Your Neighborhood By Declaring Your Disease Here!

Only declare that you have a certain disease after you have tested positive for the disease, and you are absolutely sure that you currently have the disease. Do not submit any false claims and do not declare if you are unsure that you have the disease.

False claims about having the disease will lead to overestimates of the disease in your area, leading to high inaccuracies. If you are unsure, do visit a doctor nearby so that the doctor will be able to diagnose you properly and report your disease case on your behalf.

This disease tracker is only meant for diseases including dengue, zika, HIV, AIDS and tropical diseases (including diseases caused by parasites, bacteria and insect-related ones). Other diseases not mentioned in these categories cannot be tracked via this tracker. We are still working on the app to include more diseases commonly declared in your neighborhoods for tracking.

#### Declaration Form Questions:

1. Which SEA Country Are You Residing: (Dropdown Menu)
2. Which State Of Your SEA Country Are You Living In: (Dropdown Menu)
3. Which Disease Do You Have Currently: (Dropdown Menu)
4. When Do You Think You Contracted The Disease: (DD/MM/YYYY)
5. Did You Seek Treatment In A Hospital: (Yes/No)
6. Did Your Doctor Diagnose The Disease: (Yes/No)

### Tips You Can Take As An Individual To Reduce Disease Transmission In Your Neighborhood - Save Yourself And People Around You!

#### For Dengue/Zika Diseases:

##### 1. Personal Protection:

Firstly, apply EPA-approved insect repellents containing DEET, picaridin, oil of lemon eucalyptus, or IR3535. Wear long-sleeved shirts and long pants to protect yourself from mosquito bites. Additionally, sleep under mosquito nets if possible, especially in areas where mosquitoes are prevalent. Another possible suggestion is to use screens on windows and doors to prevent mosquitoes from entering indoors.

##### 2. Environmental Control:

Regularly empty, clean, or cover containers that hold water, such as buckets, flower pots, birdbaths, and discarded tires as mosquitoes breed in standing water. At the same time, ensure proper disposal of waste to prevent the accumulation of water. Cover water storage containers to prevent mosquitoes from accessing and laying eggs in them. If possible, apply larvicides to water sources that cannot be emptied to kill mosquito larvae.

##### 3. Health Measures (Vaccinations):

While there is currently no vaccine for Zika, there is a dengue vaccine (Dengvaxia) available in some regions for people who have previously been infected with dengue. Consult a healthcare provider for suitability. Seek medical attention if you experience symptoms of dengue or Zika (such as fever, rash, joint pain, and red eyes) to receive proper care and reduce the risk of complications.

## Feature 2

### Accurate Calculator To Estimate The Amount Of Chemicals Disposed Annually In Your Industry! Try me!

Consider The Following Questions:

1. SEA Country Of Industry: (Dropdown Menu)
2. Industry Sector: (Dropdown Menu)
3. Good Type: (Input Here)
4. Units Produced: (Input Here)
5. Units Sold: (Input Here)
6. Units In Excess: (Answer in 4) - (Answer in 5)
7. Units Left In Inventory: (Input Here)
8. Units Thrown Away: (Answer in 6) - (Answer in 7)
9. Chemicals To Produce 1unit Of Good: (Input Here) litres
10. Total Chemicals Thrown Away: (Answer in 9) \* (Answer in 8)
11. Total Chemicals Discarded During Production: (Input Here) litres
12. Final Total Chemicals Discarded: (Answer in 10) + (Answer in 11)

### Guides and Tips To Reduce Chemical Disposal In Our Water Bodies - Help To Save The Lives Of Many People!

This guide is really useful for any industry in any SEA countries. This information is especially important if your industry falls under the last two categories of the short quiz and the pointers below will really help your industry to make a change for the better.

#### Points To Help Your Industry Reduce Chemical Disposal:

##### 1. Implementing Advanced Wastewater Treatment:

Industries should invest in advanced wastewater treatment technologies. These systems can filter out harmful chemicals before the water is released into natural water bodies. Techniques like reverse osmosis, activated carbon filtration, and biological treatment can effectively reduce contaminants.

##### 2. Adopting Cleaner Production Techniques:

Cleaner production involves changing industrial processes to reduce waste and pollution. This can be achieved by using less harmful raw materials, improving operational efficiency, and recycling waste products. By minimizing the use of toxic substances, industries can significantly cut down the amount of chemical waste generated.

##### 3. Promoting Sustainable Practices:

Industries should adopt sustainable practices such as using biodegradable materials and reducing the use of single-use plastics. This helps in lowering the amount of non-biodegradable waste that ends up in water bodies. Encouraging a culture of sustainability within the industry can lead to long-term benefits for the environment.

## Feature 3

### Take The Hospital Human Healthcare Tracker Questionnaire To Gauge If You Cared Enough About Your Health and Well-being Of Yourself Or Your Patients!

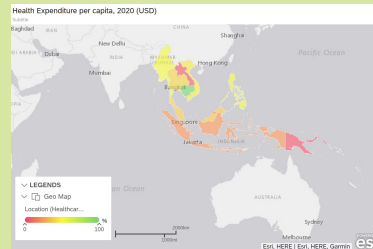
Many SEA countries are not spending enough on healthcare and well-being of the population compared to other developed nations in America and Europe. This results in higher sickness rates and disease transmissions in SEA due to poorer quality of healthcare. Many SEA countries prioritize other sectors such as military, education and infrastructure over healthcare, resulting in poor improvements in healthcare opportunities and survival rates in SEA.

As an individual, you need to sufficiently track your healthcare expenditure as maintaining good health is really important for a long life. Additionally, as a hospital, it is of paramount importance to spend on healthcare as your responsibility is to save the lives of patients who are in states of emergency.

#### For Hospitals Only:

1. Annual Research and Development Costs: \$ (Input Value)
2. Annual Cost of Medicine: \$ (Input Value)
3. Annual Cost of Medical Equipment: \$ (Input Value)
4. Annual Cost of Caring For Patients: \$ (Input Value)
5. Annual Administrative Costs: \$ (Input Value)
6. Other Expenses (If Any): \$ (Input Value)
7. Total Costs: \$ (VALUE SUM OF 1 TO 6)
8. SEA Country of Hospital: (Dropdown Menu)

## Geo-Maps



For a more detailed version, visit [Solution App - Stories - SAP Analytics Cloud](#).

For the TriGuard app with interactivity and design, check out the [Figma link below: TriGuard App Figma – Figma](#)

and many more.....

# 3

## GOOD HEALTH AND WELL-BEING



**Thank you!**

**We will be glad to answer any of your queries!**

# References

1. <https://ourworldindata.org/health-meta>
2. <https://www.unicef.org/eap/what-we-do/wash>
3. [https://health.gov/sites/default/files/2019-09/Health\\_Literacy\\_Action\\_Plan.pdf](https://health.gov/sites/default/files/2019-09/Health_Literacy_Action_Plan.pdf)
4. <https://journals.sagepub.com/doi/full/10.1177/08404704211002539>
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5590199/>
6. <https://www.cynqn.com/blog/production-and-process-optimization-in-manufacturing>
7. <https://www.sfa.gov.sg/food-information/food-safety-education/good-food-safety-practices>
8. <https://www.ncbi.nlm.nih.gov/books/NBK232686/>
9. <https://iris.who.int/bitstream/handle/10665/329531/9789289054508-eng.pdf>