Project document &submission

phase5

01

PROBLEM STATEMENT

A correlation study to assess the knowledge and self-expressed stigma regarding COVID-19 Outbreak among adults at selected society of Pune city.

Coronaviruses are zoonotic. This means they first develop in animals before developing in humans. For the virus to pass from animal to humans, a person has to come into close contact with an animal that carries the infection.

Once the virus develops in people, coronaviruses can be spread from person to person through respiratory droplets. This is a technical name for the wet stuff that moves through the air when you cough or sneeze.

The viral material hangs out in these droplets and can be breathed into the respiratory tract (your windpipe and lungs), where the virus can then lead to an infection.[1]

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus.

The virus that causes COVID-19 is mainly transmitted through droplets generated when an infected person coughs, sneezes, or exhales. These droplets are too heavy to hang in the air, and quickly fall on floors or surfaces.

People can be infected by breathing in the virus if you are within close proximity of someone who has COVID-19, or by touching a contaminated surface and then your eyes, nose or mouth.

Most people who fall sick with COVID-19 will experience mild to moderate symptoms and recover without special treatment.[2]

symptoms:

- Fever.
- Tiredness.
- Dry cough.

Some people may experience:

- Aches and pains.
- Nasal congestion.
- Runny nose.
- Sore throat.
- Diarrhoea.

Pregnant women have a higher risk of complications from other viral infections, but it’s not yetknown if this is the case for COVID-19.

COVID-19 can be diagnosed similarly to other conditions caused by viral infections: using a blood, saliva, or tissue sample. However, most tests use a cotton swab to retrieve a sample from the inside nostrils.

There’s currently no treatment specifically approved for COVID-19, and no cure for an infection,although treatments and vaccines are currently under study. Instead, treatment focuses on managing symptoms as the virus runs its course.

Corona viruses like SARS and MERS are also treated by managing symptoms. In some cases, experimental treatments are tested to see how effective they are.

Examples of therapies used for these illnesses include:

- antiviral or retroviral medications
- breathing support, such as mechanical ventilation
- steroids to reduce lung swelling
- blood plasma transfusions[3]

To prevent the spread of COVID-19:

- Avoid large events and mass gatherings.
- Avoid close contact (within about 6 feet, or 2 meters) with anyone who is sick or has symptoms.
- Stay home as much as possible and keep distance between yourself and others (within about 6 feet, or 2 meters) if COVID-19 is spreading in your community, especially if you have a higher risk of serious illness. Keep in mind some people may have COVID-19 and spread it to others, even if they don't have symptoms or don't know they have COVID-19.
- Wash your hands often with soap and water for at least 20 seconds, or use an alcohol-based hand sanitizer that contains at least 60% alcohol.
- Cover your face with a cloth face covering in public spaces, such as the grocery store, where it's difficult to avoid close contact with others, especially if you're in an area with ongoing community spread. Only use nonmedical cloth masks — surgical masks and N95 respirators should be reserved for health care providers.
- Cover your mouth and nose with your elbow or a tissue when you cough or sneeze. Throw away the used tissue.

BACKGROUND OF THE STUDY

Corona viruses are a family of viruses that can cause illnesses such as the common cold, severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). In 2019, a new corona virus was identified as the cause of a disease outbreak that originated in China.

The virus is now known as the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). The disease it causes is called corona virus disease 2019 (COVID-19). In March 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic[5]

The disease was first identified in December 2019 in Wuhan, the capital of China's Hubei province, and has since spread globally, resulting in the ongoing 2019–20 corona virus pandemic. As of 27 April 2020, more than 2.99 million cases have been reported across 185 countries and territories, resulting in more than 207,000 deaths. More than 876,000 people have recovered. Corona viruses were identified in the mid-1960s and are known to infect humans and a variety of animals (including birds and mammals). Since 2002, two corona viruses infecting animals have evolved and caused outbreaks in humans: SARS-Cove (Severe Acute Respiratory Syndrome) identified in southern China in 2003, and MERS-CoV (Middle East Respiratory Syndrome), identified in Saudi Arabia in 2012. Together, they have caused more than 1600 deaths.

Two other recent coronavirus outbreaks have been experienced. Middle East Respiratory Syndrome (MERS-CoV) of 2012 was found to transmit from dromedary camels to humans. In 2002, Severe Acute Respiratory Syndrome (SARS-CoV) was found to transmit from civet cats to humans.[6]

Although COVID-19 has already shown some similarities to recent coronavirus outbreaks, there are differences and we will learn much more as we deal with this one. SARS cases totaled 8,098 with a fatality rate of 11 percent as reported in 17 countries, with the majority of cases occurring in southern mainland China and Hong Kong. The fatality rate was highly dependent on the age of the patient with those under 24 least likely to die (one percent) and those over 65 most likely to die (55 percent). No cases have been reported worldwide since 2004.

According to the World Health Organization (WHO), as of 2020, MERS cases total more than 2,500; have been reported in 21 countries, and resulted in about 860 deaths. The fatality rate may be much lower as those with mild symptoms are most likely undiagnosed. Only two cases have been confirmed in the United States, both in May of 2014 and both patients had recently travelled to Saudi Arabia. Most cases have occurred in the Arabian Peninsula. It is still unclear how the virus is transmitted from camels to humans. Its spread is uncommon outside of hospitals. Thus, its risk to the global population is currently deemed to be fairly low.[7]

NEED OF THE STUDY

A novel corona virus, 2019-nCoV, has been identified as the cause of an outbreak of respiratory illness that originated in Wuhan, China, and which has spread to several other countries around the world.

Public health emergencies during outbreak of communicable diseases may cause fear and anxiety leading to prejudices against people and communities, social isolation and stigma. Such behaviour may culminate into increased hostility, chaos and unnecessary social disruptions. Cases have been reported of people affected with COVID-19 as well as healthcare workers, sanitary workers and police, who are in the frontline for management of the outbreak, facing discrimination on account of heightened fear and misinformation about infection. Even those who have recovered from COVID-19 face such discrimination. Further, certain communities and areas are being labelled purely based on false reports floating in social media and elsewhere. There is an urgent need to counter such prejudices and to rise as a community that is empowered with health literacy and responds appropriately in the face of this adversity.[9]

Overworked Indian medical professionals are now increasingly fighting on a whole new front in the Covid-19 battle: stigma. Fully under the grip of the global pandemic, the country is reporting cases of doctors, nurses, and other health care professionals, on the frontline of the battle, being shunned byothers for fear of being infected.

Slum in the central Indian city of Indore when the mob attacked. Group of public-health workers had been tracking down a man who might have had contact with a recently confirmed case of the corona virus. When they found him, he cursed at them, asking why they wanted his information and accusing them of trying to take him away. Almost immediately, at least 100 people surrounded the team, throwing stones and other objects.[10]

In the southern city of Bengaluru (formerly known as Bangalore), health workers were attacked as they went door to door checking people for symptoms. In the central city of Bhopal, doctors returning from an emergency shift were stopped by the police, accused of spreading the virus, and beaten with batons. And in New Delhi, one doctor was assaulted by a shopper at a local fruit market, while neighbours of one of her colleagues attempted to force the woman from her apartment building.[11]

In some cases, the way testing was conducted also caused problems: one couple in the eastern state of Bihar said that their son was told to come out of their apartment building and into the street to give his swab for testing. He was in home quarantine after returning from Canada. Seeing so many doctors in hazmat suits made our neighbours really scared. People stopped saying hello - even froma safe distance.

They added that their son tested negative, but the discrimination continues.12

Panic gripped Nagpur as four suspected corona virus patients ran away from a government-run hospital.[13]

There are many examples for which people have misconceptions and stigma about the covid 19 disease. As seen from the recent data in India, the stigma attached to COVID-19 and the fear of isolation may be the reasons for people shying away from being diagnosed.

With several reports now emerging that people suspected of coronavirus infection are fleeing from quarantine facilities in India owing to isolation and social stigma fears, this can lead to unnecessary panic and spread of the deadly disease

There is need for this study as the researcher is interested in this topic .When the researcher saw such incidents in the news and media, many people are suffering from the wrong perception and stigma about COVID19 disease. This is happen because of people do not have sufficient information about the COVID 19 disease. Through this study assess the knowledge and self-expressed stigma regarding COVID-19 Outbreak among adults.

HYPOTHESES

H01: There is no significant association between the levels of knowledge regarding COVID 19 outbreak with selected socio- demographic variables.

H02 There is no significant association between self-expressed stigmas regarding COVID19 outbreak with selected socio- demographic variables.

H1: There is significant difference between the levels of knowledge and self-expressed stigma regarding COVID19 outbreak with selected socio- demographic variables.

OPERATIONAL DEFINITION

ASEESS: Assess means to evaluate the value or quality of particular subject.

In this study assess means to evaluate the knowledge regarding the COVID 19.

SELF EXPRESSED: Self-expression is the expression of your personality, feelings, or opinions.In this study self-expressed means assess the feeling and opinions of adult regardingthe stigma of COVID19.

STIGMA: Stigma is a mark of disgrace that sets a person apart from others. In this study stigma means misassumptions about the COVID 19 in the adult.

COVID 19: Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus.

ADULTS:-Adults refers to a fully grown person who is legally responsible for their actions. In this study, Adults refers Male and female age group between 18- 55 years.

RESEARCH METHODOLOGY

RESEARCH APPROACH

A descriptive, cross sectional study was used to assess the knowledge and self-expressed stigma regarding COVI19

RESEARCH DESIGN

Non-experimental descriptive research is the label given to a study when a researcher cannot control, manipulate or alter the predictor variable or subjects, but instead, relies on interpretation, observation or interactions to come to a conclusion.

RESEARCH SETTING

The study will be conducted in selected areas of Pune city

DEVELOPMENT AND DESCRIPTION OF THE TOOL

Before developing the tool an extensive review of literature was done. Books and articles were also studied. Opinion and suggestion from various experts in the field and exposure of the investigator in the area of research were considered.

The investigator selected the following tool for data collection. The tools were constructed according to the objective of the study it consists of three sections.

- Section I Demographic profile
- Section II To assess the knowledge regarding COVID-19 Outbreak among adults
- Section III To assess the self-expressed stigma regarding COVID-19 Outbreak among adults

02

THINKING PROCESS

Abstract: The highly complex and controversial topic of vaccine safety communication warrants innovative, user-centered solutions that would start with gaining mutual respect while taking into account the needs, concerns and underlying motives of patients, parents and physicians. To this end, a non-profit collaborative project was conducted by The Vienna Vaccine Safety Initiative, an international think tank aiming to promote vaccine safety research and communication, and the School of Design Thinking in Potsdam, Germany, the first school for innovation in Europe. The revolutionary concept of the Design Thinking approach is to group students in small multi-disciplinary teams. As a result they can generate ground-breaking ideas by combining their expertise and different points of view.

The Need to Innovate Communication Around Infectious Disease Prevention

The level of suffering seen in emergency rooms and hospitals during the peak of recent influenza pandemics is saddening, but highly instructive. Not only are those infected suffering, but also those seeking help because of fear and anxiety. Now, as we have reached a phase of "pandemic fatigue", people are still at risk, especially pregnant women and children. While children are among the most severely affected by vaccine preventable diseases, they are also the most avid transmitters of infectious diseases with the least access to timely treatment in developing countries. Alternative prevention methods such as respiratory masks and hand washing are of little use in children. Vaccines are effective tools to prevent a large number of infectious diseases and their complications. A good example for the potential impact of vaccines is the eradication of smallpox [1]. The WHO has since named the eradication of poliomyelitis and measles public health priorities for the years to come [2, 3]. Emphasizing the importance of vaccines in the fight against communicable diseases, vaccine communicators have to find new ways of effectively addressing all stakeholders.

Getting Children, Parents, and Vaccine Experts Involved

To encourage parents, children, and medical staff to communicate openly the prevention of infectious diseases, all parties should be actively involved in the discussion. Most parents want their child to be healthy and seek information from their doctors [4]. All too often, parents remain unsatisfied with the amount of information received during brief physician encounters [5]. Many parents resort to the media and the internet, sometimes leading to misperceptions of vaccine safety and effectiveness [6, 7].

To address this concern, a collaborative *pro bono* project was initiated by The Vienna Vaccine Safety Initiative, an international vaccine safety think tank (ViVI; www.vi- vi.org) and the first innovation school in Europe, the School of Design Thinking at the Hasso Plattner Institute in Potsdam, Germany. The result was a 12-week (advanced track) Design Thinking project dedicated to facilitating the dialogue between doctors and parents regarding the prevention of infectious diseases.

The Vienna Vaccine Safety Initiative (ViVI) is an industry-independent *pro bono* initiative dedicated to scientific research. The ViVI think tank consists of vaccine safety experts from developed and developing countries,

The Vienna Vaccine Safety Initiative (ViVI)

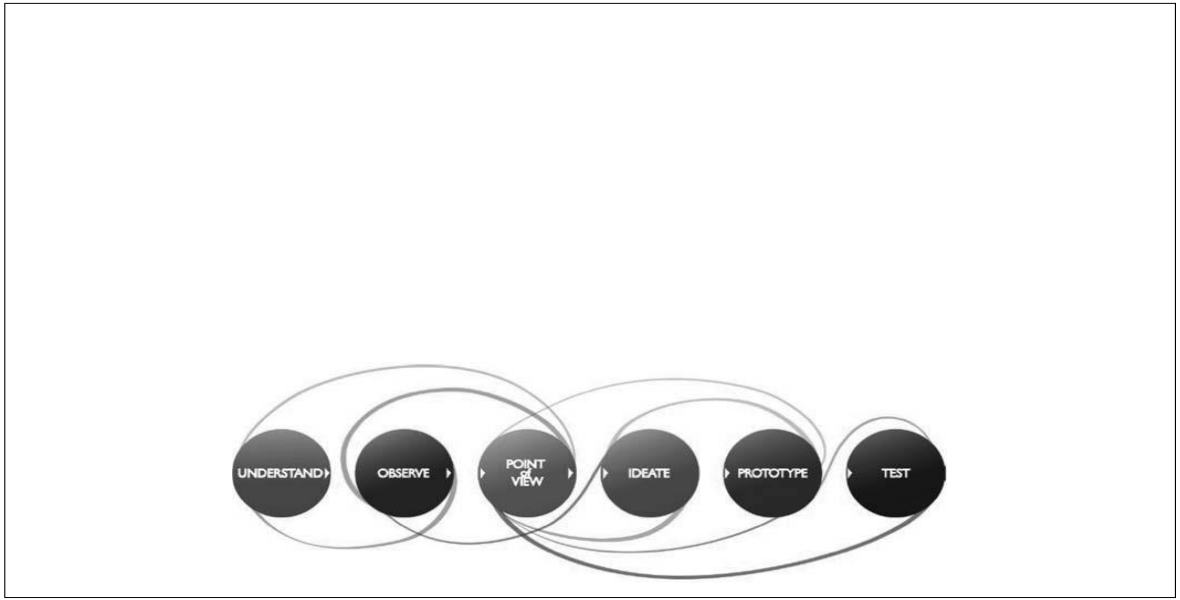
The Vienna Vaccine Safety Initiative (ViVI) is an international scientific forum aiming to promote evidence-based vaccine safety research and communication [8].

As a community sharing a common interest – the safe and effective prevention of infectious diseases – the think tank aims to raise awareness of important tasks at hand, by means of transparent scientific investigation [2]. All current and past *pro bono* projects are documented online (www.vi-vi.org), with references to published articles.

The ViVI-website aims to engage both, highly specialized vaccine safety experts as well as concerned consumers and vaccine recipients to bridge the gap between vaccine safety discussions in different networks. Intimidating images of diseased individuals, syringes or other "vaccine-stereotypes" are intentionally omitted. A simple, clear design was developed using soft and bright colors to establish a neutral, welcoming and playful atmosphere. Using a Design Thinking approach, the ViVI imagery and communication style avoids paternalistic as well as overly emotional content, as often encountered in vaccine-related online resources. Design Thinking considerations play a major role during project development [9].


Vienna Vaccine Safety Initiative
ViVI
about ViVI
projects
publications
collaborate
VaccApp©
communicating
vaccine
safety
login
Parents. Scientists. You. Let's eradicate disease!
contact

How Design Thinking Works



The iterative work process is influenced by the way product designers would approach a given problem. The process of Design Thinking involves several consecutive steps to be repeated and iterated in a circular manner.

The first step for the Design Thinking team is to **understand** the scope or content of a given design challenge, to frame a user-centered approach and to **observe** potential end-users of a service or product for additional insight and empathy. This includes the uncovering of unconscious motives, latent needs and central conflicts. Next, the Design Thinkers aim to generate a **point of view**, as a consensus process within the multi-disciplinary team to define a "design stance" representing perspectives gained from qualitative research.

Only after the initial steps have been reiterated multiple times, does the team finally move on to the **ideation** of possible solutions. Aiming to maintain a visual and intuitive approach to the design question at hand, rapid **prototyping** is key, leaving sufficient time to **test** and generate end-user feedback. Whenever issues are encountered, the previous steps are reiterated until user feedback finally indicates a break-through. Similar to product designers, multiple prototypes are generated to allow for selection and refinement of the most impactful and user-friendly approach [10]. Multiple **iterations** and feedback loops force the team to keep the "big picture" and the end-user perspective in mind.

which may lead to *omission bias*. This bias describes the increased likelihood to omit a specific action, even if the consequences of that omission turn out to be more harmful than the initial action (*e.g.* refusing a vaccination due to fear of adverse vaccination events, even if this refusal may increase the vulnerability to future outbreaks of VPD) [24]. This omission bias jeopardizes disease eradication programs, which are highly dependent on coverage rates.

Research has shown that there are two key information sources for parents seeking advice with regard to vaccines besides friends and family: first, healthcare providers (medical doctors and midwives) and, second, online resources and the internet in general [25]. Medical doctors are key informants, not only with respect to patients and concerned parents, but also to the media and general public [23]. It is, therefore, important to engage parents actively, motivating them to seek any required information from a trusted physician. Physicians should address concerns appropriately and provide adequate information resources (on- and offline) for further reading. Parents unable to obtain answers during the doctor's visit may feel unsettled about the topic, and will be seeking additional information from alternative sources, often with little or no professional guidance [7]. Vaccine communication could be further improved with the help of practical tools promoting an active dialogue between parents and physicians.

OBSERVE

Covering the Bases: How Could We Improve Immunization Records?

During the explorative phase of the project, it became obvious that a large number of parents are not only worried about the safety of vaccines, but they are also uncertain which vaccines have been administered to their children. When questioned, parents are often unable to tell off-hand which diseases their child should be protected from, and to what degree. Often, parents may only remember "usual" or travel vaccinations. In some instances, parents may not remember whether a flu vaccine was even considered [26].

Informing parents about the current vaccination status of their child and any preliminary considerations resulting in this status, is an indispensable first step. Well-informed parents will act as a reliable source for other parents seeking the same information [6]. Incomplete vaccination histories on the other hand, may lead to omission of required immunizations. Few physicians seem to be aware of the importance of vaccination histories and even fewer are documenting the vaccination status on a regular basis [27, 28]. Consequently, families are not reminded of necessary booster vaccinations. Undocumented vaccinations may have important implications by either delaying the differential diagnosis of vaccine preventable diseases or masking adverse events following immunization. For any program aiming to assess the effectiveness of vaccines, accurate vaccination records are essential.

POINT OF VIEW

What is “Accurate Information”?

Today the amenities of the internet allow easy access to an enormous amount of information, enabling the mutual exchange of personal experience [30]. Those interested in communicating vaccine benefits and risks engage in active discussions. These sites contain important feedback and information for stakeholders and healthcare professionals increasing awareness of vaccine fears and rumors and enabling active and transparent vaccine communication. While the plethora of different vaccine stakeholders’ internet representations provide important input, they may also be perceived as confusing to lay persons seeking help online [6]. Contradictory information may lead to rumors or misperceptions, lacking a clearly identifiable source. A concerned parent left alone with this uncertainty, may remain passive and unmotivated to comply with immunization recommendations [24]. Online sites may provide a promising opportunity for informed decision-making while presenting vaccine information in a neutral format, edited by experts with no potential conflict of interest in vaccine sales or distribution [6]. Web-based information sources should be viewed as a medium for real time dialogue between users and experts.

Addressing Concerns and Confusion

After extensive field research, including interviews with international experts, parents, pediatricians, and children, the Design Thinking Team generated representative „personae“ helping to develop empathy with the concerned parent. The team decided to focus on the issue of trust accompanied by time and peer pressure. This pressure emerges with confusing and contradicting information from different peers and media sources. Well-educated parents, used to making decisions independently, were often unwilling to rely on a single source of information [31]. Overprotective first-time parents may feel overwhelmed by the event of birth of their first-born child. At a time of overwhelming emotion, stress and multiple adjustments, it may be particularly difficult to decide upon vaccinations. It was recommended to approach the topic of child safety and immunization much sooner, *i.e.* during the time of pregnancy. Concerns about vaccine safety and the complexity of vaccination schedules were identified as potential barriers. The Design Thinking Team sought additional means of educating and demystifying the topic of vaccination. Aiming to develop a safe environment where views may be exchanged freely, the language of discourse (such as ‘pro’ and ‘contra’) was replaced by ‘concerns’ and ‘explanations’ emphasizing understanding and informed decision-making.

IDEATION: In the face of an abundance of vaccine information, tailored information for pregnant women may be more effective and lead to well-informed decisions [33]. In practice, the timing may prove challenging, as pediatricians usually do not get in touch with parents until after birth. Improved communication between pediatricians and obstetricians may lead to new information programs. Professional training has to be intensified, ensuring that all pediatricians and obstetricians attend formal vaccine training including effective risk-benefit communication.

When pediatricians and obstetricians are talking with soon- to-be parents, the topics of vaccination and infectious disease prevention must not be isolated, but rather be embedded in general safety education. The question "How can I protect my child from being harmed?" is a natural one during pregnancy. Creating a child-proof household environment, choosing a certificated baby stroller and car seat, should be viewed as similarly important as getting informed about childhood vaccination. Thus, suitable vaccine and safety communication tools should be available from the beginning of pregnancy, supporting different stages of parenthood while addressing specific concerns and needs

Addressing Vaccine Myths

Stress may be responsible for intuitive and nonsystematic decision making [34, 35]. It is important to identify underlying concerns and addressing these in a simple, comprehensible and visual format. One of the team's observations was that "vaccine myths" are reinforced until they are becoming conviction. One example is the concern that some vaccines may allegedly contain 'high amounts of dangerous mercury'.

To demystify the rumors around vaccination, the team developed visualizations aiming to put a claim into perspective using tangible info-graphics, analogies and objects familiar to the parents. An example, shown in Fig. **3**, represents a simple visual graphic demonstrating the content of mercury in a vaccine compared to a common

fig(1). Potential Stages in the evolution of an immunization program, showing the interaction between vaccine coverage, disease incidence and incidence of adverse events following immunization. In Robert Chen's model, the restoration of confidence will finally lead to eradication of the VPD [14].

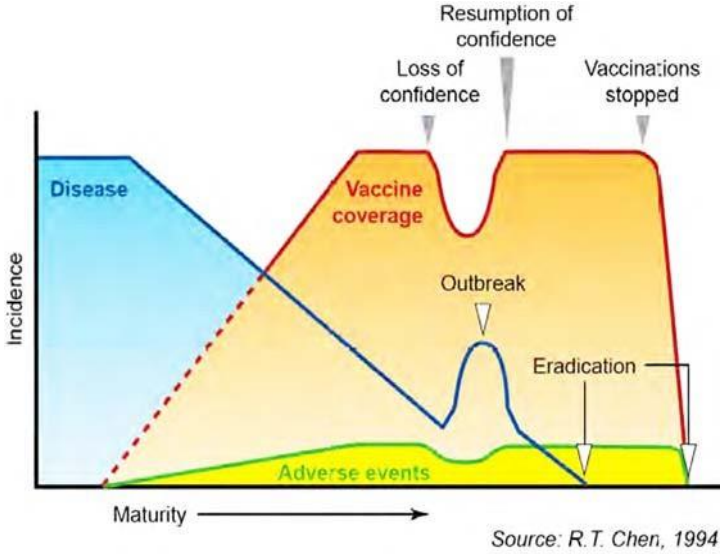


fig . (2). visualizes the team's hypothesis demonstrating the two influential factors on finding the 'right time' for physicians to inform parents about vaccinations. The pregnancy period could be used to provide vaccine information, when awareness of vaccination issues is high (before decreasing in favor of other urgent issues), while stress levels remain low allowing a rational approach to the topic. SOURCE: HPI School of Design Thinking.

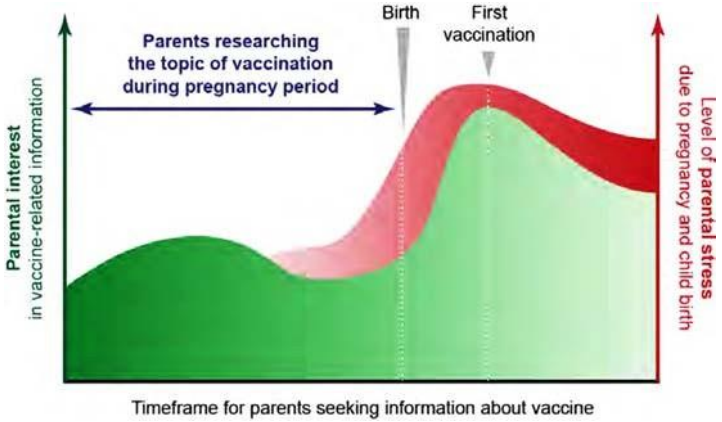
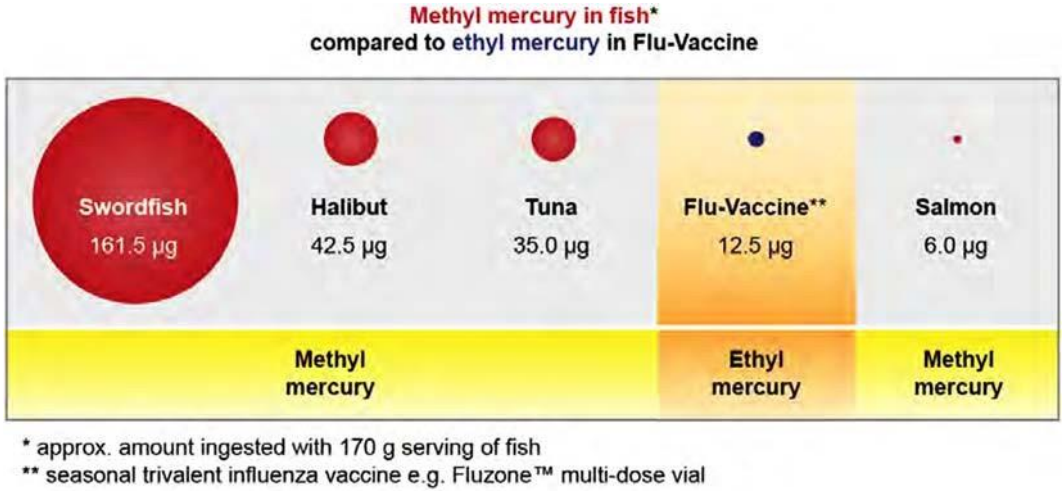


fig. (3). The graphic shows the prototype of an educational tool, which sets complicated data, comparing the amount of mercury in a vaccine
[36] to well-known quantities, such as one serving of fish [37]. SOURCE: HPI School of Design Thinking.



Digitizing Vaccination Records

While doctors and associate healthcare professionals remain the primary source of preventive healthcare information, autonomous searches of diverse online resources are increasingly common. A national telephone survey conducted in 2010 in the U.S. showed that 59% of interviewed adults had been searching online for information on a specific disease or treatment [25]. Concerned parents often inquire about reliable and neutral online resources helping them to navigate through vaccine information online. An impartial internet platform provided by industry independent institutions appeared to be suitable when providing access to expert consultations. It was suggested to integrate interactive blogs and patient community aspects. To motivate young audiences to get informed about vaccines and immunization, teenagers should be encouraged to keep a "junior vaccination record" of their own (initially in addition to the official version) including games and quizzes for educational purposes. Digital records could also facilitate the distribution of vaccine-related information to future parents at a time before the child is born, and, with adequate data protection, communication with pediatricians and obstetricians.

Providing Universal Access to Vaccination Records

While mobile phones are just one of many options for communication, in developing countries they represent important means of health communication, and are sometimes life-saving. Telephone poles for mobile networks are easier to install than landlines which may be compromised by limited accessibility, flooding, or even landmine residuals [38]. The number of mobile telephone users is still increasing, and approximately 80% of growth in the number of mobile service subscribers will be derived from developing markets, where mobile phones are also used for daily activities including money transfers [39, 40].

In the medical sector, mobile phones may ease the number of processes [41]: While paper-based medical information such as the international WHO vaccination record may get lost or destroyed, digital vaccination records on mobile phones may provide a safer option [42]. In areas with limited infrastructure and extended travel time between medical centers, turnaround time due to loss of paper-based documents may pose a noteworthy problem [43]. A number of pilot studies conducted in low resource settings clearly demonstrated the usefulness of medical information systems *via* Short Message Service (SMS) and mobile phones [43- 45].

The lack of consistent vaccination records is not only a problem restricted to developing country settings. Vaccination records are unavailable in more than fifty percent of unplanned visits to pediatric emergency rooms [28].

AND REITERATE

The VAccApp™ has since been completed and scheduled for beta-testing in pediatric waiting rooms and inpatient units. In this situation, parents may be more aware of the need to clarify the immunization status of their children. To continue the Design Thinking process, the parents' and physicians' feedback will lead to rethinking and redesigning the VAccApp™, until it meets the needs of all stakeholders.

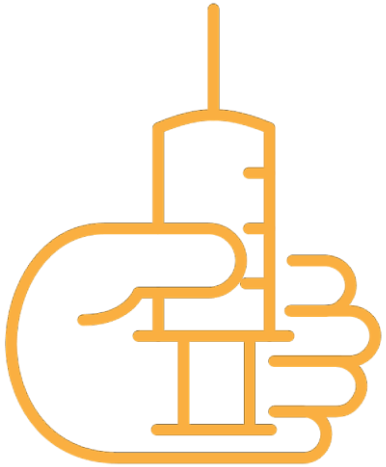
Further to serving as a digital representation of the vaccination record, the VAccApp™ is also a tool to enhance physician-patient communication. The idea is to initiate the dialogue virtually, but to continue strengthening the physician- patient relationship, promoting patient empowerment and shared decision making. Users of the VAccApp™ will be well- informed about their own and their families' vaccination status – even at times when the smartphone is not at hand. Further research will assess the practical use of the VAccApp™ as well as its impact on the self-reporting and knowledge of the vaccination status among VAccApp™ users compared to those using conventional paper-based vaccination records.

03

PHASE DEVELOPMENT

Why do we need vaccines for COVID-19?

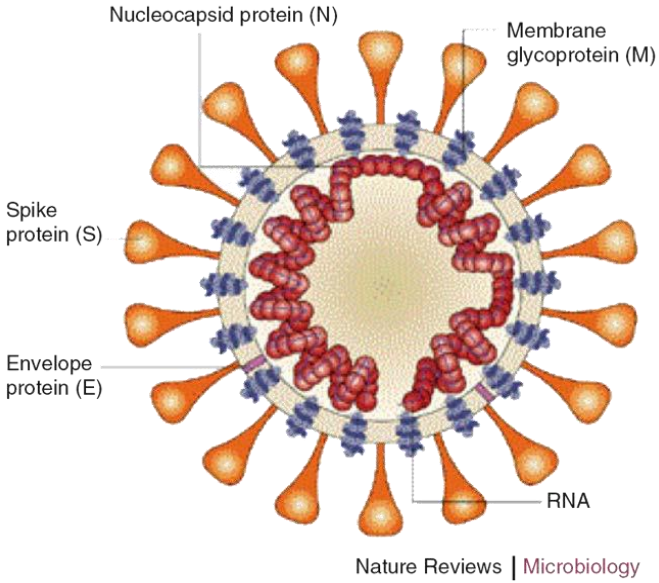
- **Vaccines can prevent infectious diseases.** Vaccines do prevent measles, polio, hepatitis B, influenza and many others.
- When most people in a community are protected by vaccination, the ability of the pathogen to spread is limited. This is called ‘herd’ or ‘indirect’ or ‘population’ immunity.



How COVID-19 vaccines work

Vaccines greatly reduce the risk of infection by training the immune system to recognize and fight pathogens such as viruses or bacteria

- If the person is infected by the virus later on, the immune system recognizes the virus and, because it is already prepared to attack the virus, protects the person from COVID-19



How safe are the COVID-19 vaccines?

- **The safety requirements for COVID-19 vaccines are the same as for any other vaccine and will not be lowered in the context of the pandemic**
- Safety trials begin in the lab, with tests and research on cells and animals first, before moving on to human studies
- The principle is to start small and only move to the next stage of testing if there are no safety concerns
- Clinical trials are evaluating COVID-19 vaccines in tens of thousands of study participants to generate the scientific data and other information needed to determine safety and effectiveness
- These clinical trials are being conducted by manufacturers according to rigorous standards
- The COVID-19 vaccines are tested in a broad population of people – not only young, physically fit volunteers, but also older people and people with underlying health conditions

Monitoring of adverse events following immunization:

Monitoring of adverse events following immunization (AEFI) is an essential strategy for ensuring the safety of vaccines

- At the time of vaccine introduction, all countries should have an AEFI surveillance system in place as described in the Global Manual on Surveillance of AEFI1
- All AEFIs should be reported using the standard COVID-19 AEFI reporting form using the fastest means possible

DESIGN INTO INNOVATION

1. Data Collection:

Gather a comprehensive dataset that includes features such as location, size, age, amenities, nearby schools, crime rates,and other relevant variables.

1. Data Preprocessing:

Loading and preprocessing the dataset is an important first step in building up any machine learning model. By loading and preprocessing the dataset, we can ensure the machine learning algorithm is able to learn from the data effectively and accurately.

Data set : https://www.kaggle.com/datasets/gpreda/covid-world-vaccination-progress

1. Loading the dataset:

To load a dataset in Python, we make use of various libraries, such as Pandas, NumPy, and scikit-learn, depending on the dataset's format and our specific requirements. The term "dataset" is quite broad, so the method that we use may vary depending on whether we have a CSV file, Excel file, SQL database, or some other format. Since we are given a csv file, we make use of the read_csv() method to read the given dataset file.

PROGRAM:

Since we are given two datasets, we are going to load bothof these datasets separately.

1. Dataset named country_vaccinations:

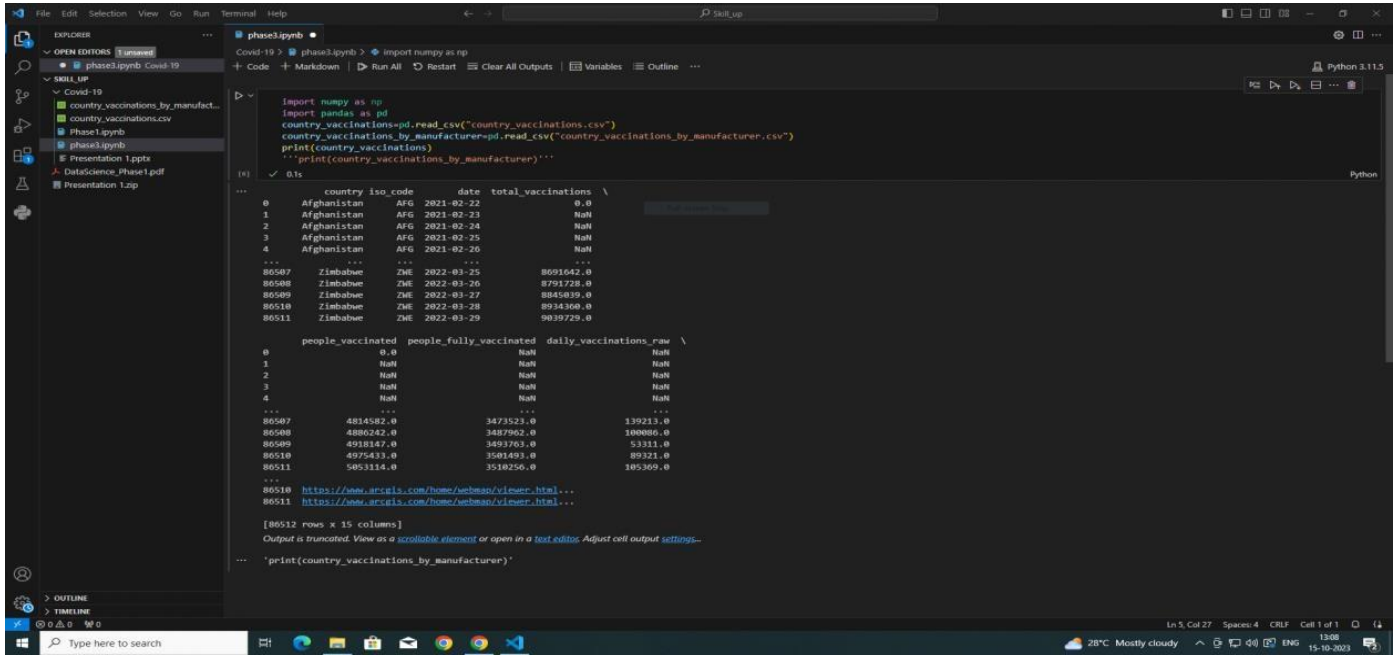
```
 import numpy as npimport
pandas as pd
country_vaccinations=pd.read_csv("country_vaccinations.csv")
print(country_vaccinations)
```

Dataset named country_vaccinatioins_by_manufacturer:

```
import numpy as npimport
pandas as pd

Country_vaccinations_by_manufacturer=pd.read_csv("country_vacci
nations_by_manufacturer.csv")

print(country_vaccinations_by_manufacturer)
```


File Edit Selection View Go Run Terminal Help
Skill_up
EXPLORER
OPEN EDITORS 1 unsaved
phase3.ipynb Covid-19
SKILL_UP
Covid-19
country_vaccinations_by_manufact...
country_vaccinations.csv
Phase1.ipynb
phase3.ipynb
Presentation 1.pptx
DataScience_Phase1.pdf
Presentation 1.zip
phase3.ipynb
Covid-19 > phase3.ipynb > import numpy as np
Code Markdown Run All Restart Clear All Outputs Variables Outline
Python 3.11.5
import numpy as np
import pandas as pd
country_vaccinations=pd.read_csv("country_vaccinations.csv")
country_vaccinations_by_manufacturer=pd.read_csv("country_vaccinations_by_manufacturer.csv")
print(country_vaccinations)
'''print(country_vaccinations_by_manufacturer)'''
0.1s
Python
country iso_code date total_vaccinations \
0 Afghanistan AFG 2021-02-22 0.0
1 Afghanistan AFG 2021-02-23 NaN
2 Afghanistan AFG 2021-02-24 NaN
3 Afghanistan AFG 2021-02-25 NaN
4 Afghanistan AFG 2021-02-26 NaN
86507 Zimbabwe ZWE 2022-03-25 8691642.0
86508 Zimbabwe ZWE 2022-03-26 8791728.0
86509 Zimbabwe ZWE 2022-03-27 8845039.0
86510 Zimbabwe ZWE 2022-03-28 8934360.0
86511 Zimbabwe ZWE 2022-03-29 9039729.0
people_vaccinated people_fully_vaccinated daily_vaccinations_raw \
0 0.0 NaN NaN
1 NaN NaN NaN
2 NaN NaN NaN
3 NaN NaN NaN
4 NaN NaN NaN
86507 4814582.0 3473523.0 139213.0
86508 4886242.0 3487962.0 100086.0
86509 4918147.0 3493763.0 53311.0
86510 4975433.0 3501493.0 89321.0
86511 5053114.0 3510256.0 105369.0
86510 https://www.arcgis.com/home/webmap/viewer.html...
86511 https://www.arcgis.com/home/webmap/viewer.html...
[86512 rows x 15 columns]
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'print(country_vaccinations_by_manufacturer)'
OUTLINE
TIMELINE
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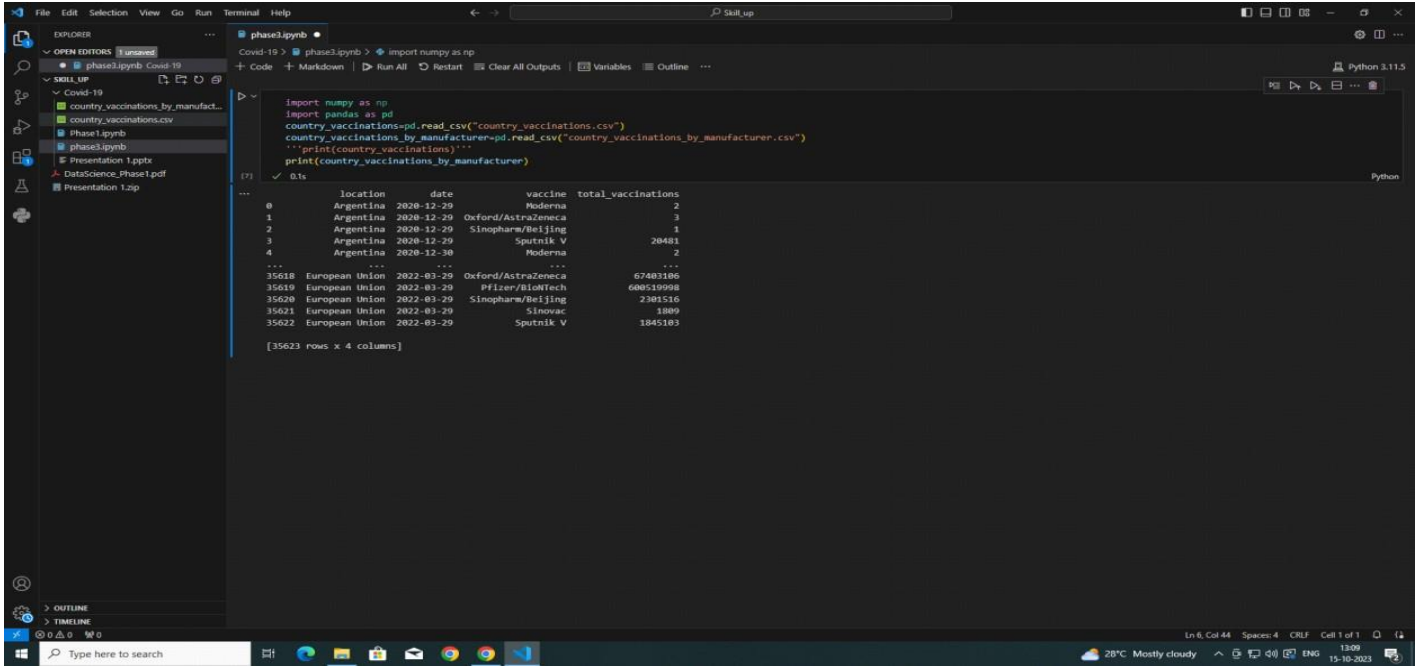
15-10-2023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'''print(country_vaccinations)'''
print(country_vaccinations_by_manufacturer)
0.1s
Python
location date vaccine total_vaccinations
0 Argentina 2020-12-29 Moderna 2
1 Argentina 2020-12-29 Oxford/AstraZeneca 3
2 Argentina 2020-12-29 Sinopharm/Beijing 1
3 Argentina 2020-12-29 Sputnik V 20481
4 Argentina 2020-12-30 Moderna 2
... ...
35618 European Union 2022-03-29 Oxford/AstraZeneca 67403106
35619 European Union 2022-03-29 Pfizer/BioNTech 600519998
35620 European Union 2022-03-29 Sinopharm/Beijing 2301516
35621 European Union 2022-03-29 Sinovac 1009
35622 European Union 2022-03-29 Sputnik V 1845103
[35623 rows x 4 columns]
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1. Preprocessing the dataset:

- Data preprocessing is the process of cleaning, transforming, and integrating the data in order to make it ready for analysis.
- This may involve removing errors and inconsistencies, handling missing values, transforming the data into a consistent format, and scaling the data to a suitable range.

1. Data Cleansing:

1) Data cleansing for the dataset country_vaccinationsare represented pictorially below with their source code. It Includes removing missing values in the dataset, dropping those missing values.

Program:

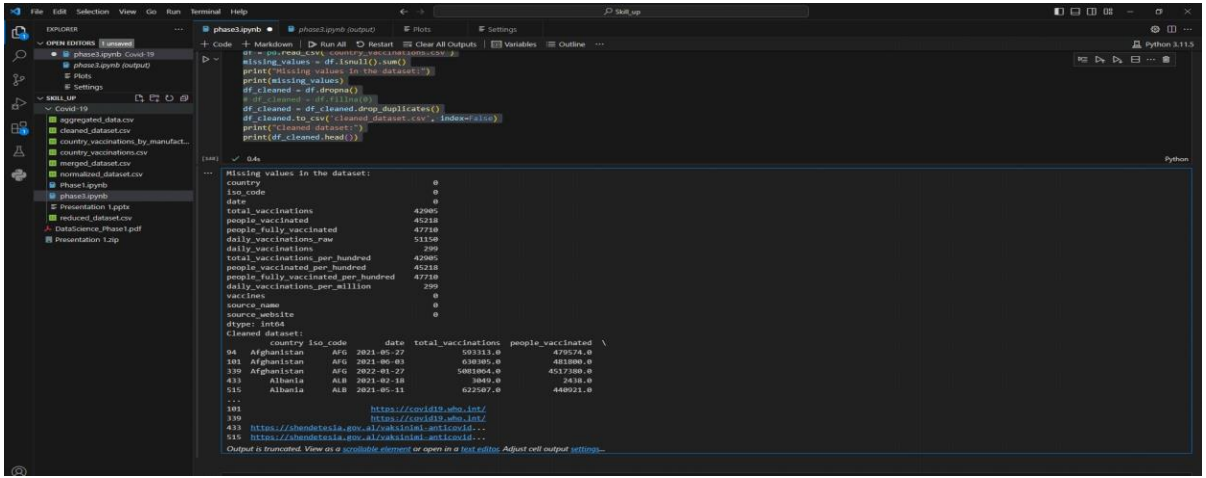
```
import pandas as pd
df = pd.read_csv('country_vaccinations.csv’)
missing_values = df.isnull().sum()
print("Missing values in the dataset:")
print(missing_values)
df_cleaned = df.dropna()
# df_cleaned = df.fillna(0)
df_cleaned =df_cleaned.drop_duplicates()
```

```
df_cleaned.to_csv('cleaned_dataset.csv', index=False)

print("Cleaned dataset:")

print(df_cleaned.head())
```

Output:



Conclusion:

In the intricate pulse of covid 19 pandemic analysis service as the guiding line illuminating the path to understand, responding and recovering. Through the lens of data analysis, we inch closer to the world were the virus is but a memory with insight we strengthen our resolve adopt our strategies and pave to way our healthier safer future. We find hope and collective strength to overcome the challenge that covid 19 host.