



MEDCHAIN

MEDICINE | BLOCKCHAIN



LOTS OF VACCINATION SINCE OUR BIRTH

Hong Kong children need **at least 17 different doses** of vaccines from their **birth to 12 years old**, according to the city's Childhood Immunization Program recommended by the Department of Health. That is not counting **7 optional vaccines covering influenza and cervical cancer**.



DO YOU REMEMBER THESE?



Rabies vaccine maker fined US\$1.3 billion after safety scandal

17 Oct 2018 - 1:50am 1 1



China's vaccination vacationers poised to hand Hong Kong a bonanza

18 Aug 2018 - 4:01pm 10



Top officials sacked over China's vaccine scandal

16 Aug 2018 - 11:28pm 9

Source:

<https://www.scmp.com/news/china/society/article/2159318/vaccine-scandal-one-china-have-eventually-led-reforms-and-safer>

<https://www.scmp.com/news/china/policies-politics/article/2156357/new-vaccine-scandal-grips-china-parents-say-theyve-lost>



Vaccine scandal: number of substandard doses doubles to 500,000

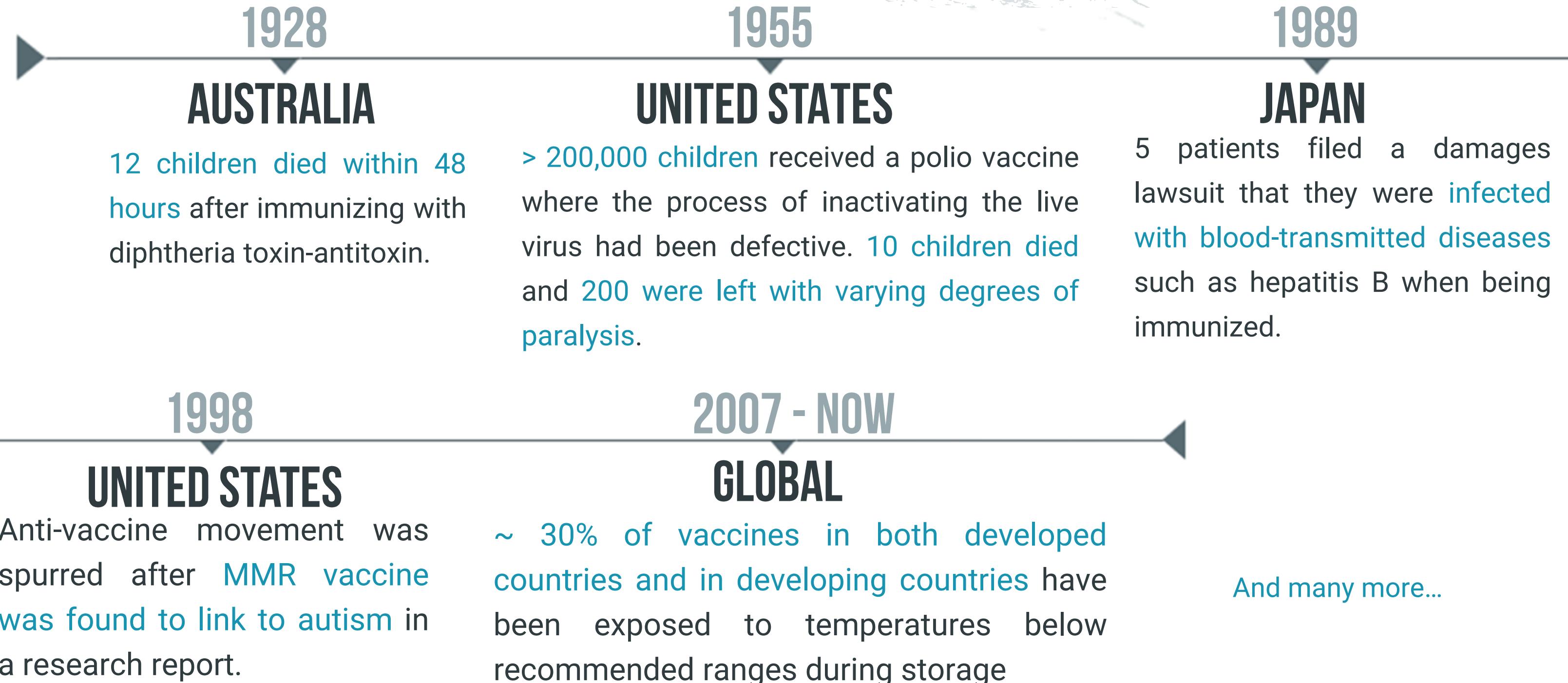
- Repeated vaccine scandals over the years
 - In 2013, 17 babies died after injecting with a hepatitis B vaccine
 - In 2016, a scandal revealed vaccines worth 570 million yuan (US\$83.4 million) had been improperly stored and sold to 24 provinces since 2011
 - Many and many...
 - The most recent scandal: in **Jul 2018**, Chinese drug maker found supplying > **250,000** substandard vaccines that were given to **babies as young as three months old** and affected **~100 million people** in China



DOES THIS ONLY HAPPEN

IN CHINA?

GLOBAL VACCINATION PROBLEM



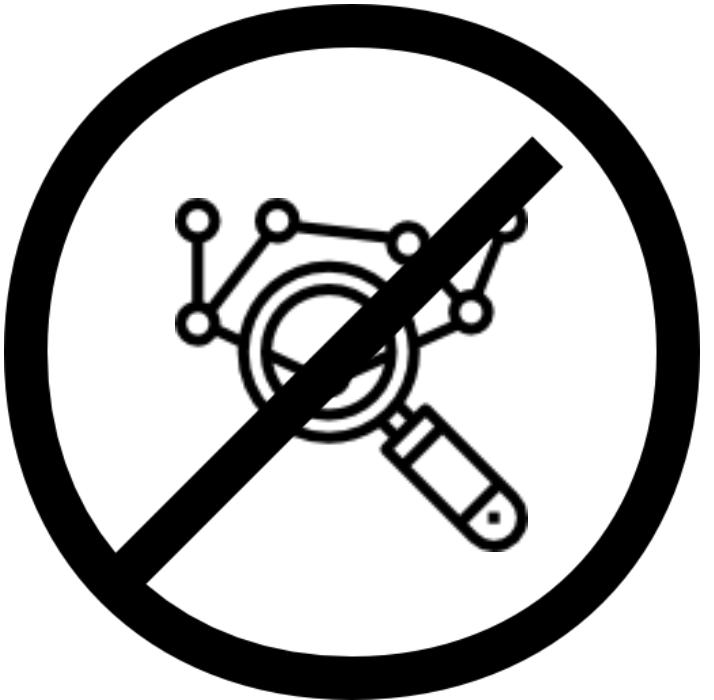
Source:

<https://www.scmp.com/news/china/society/article/2159318/vaccine-scandal-one-china-have-eventually-led-reforms-and-safer>

<http://www.cidrap.umn.edu/news-perspective/2017/03/freezing-shortages-among-global-vaccine-challenges>

<https://www.usnews.com/news/blogs/data-mine/2015/01/26/whats-really-behind-the-measles-outbreak>

TODAY'S CHALLENGES

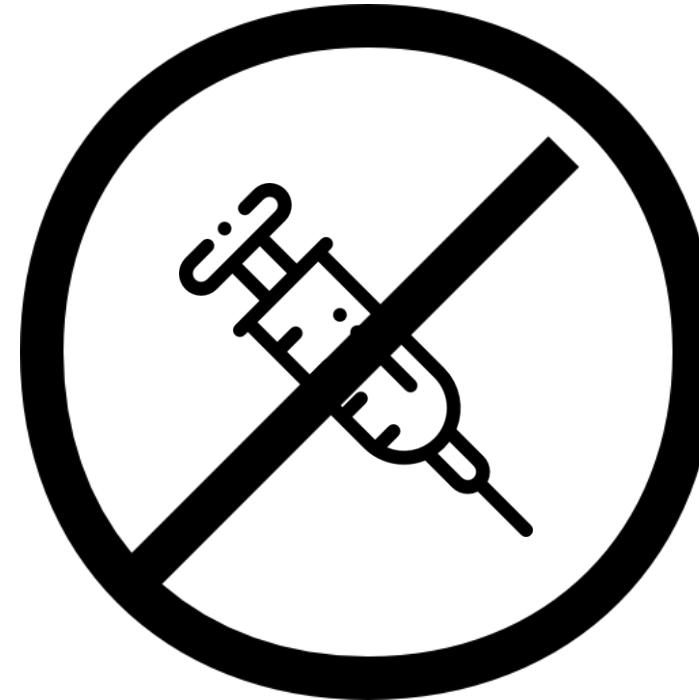


DIFFICULTY TO TRACE BACK

Low transparency of the vaccine journey from production, to storage, to transportation and to injection

Takes a long time of investigation to find out the source of problem

The slow or lack of follow-up can cause severe drawbacks, e.g. paralysis, vital diseases and even death



ANTI-VACCINATION CAMPAIGN

Public loss faith in the vaccination system

Some researches found that there is causation between vaccines and diseases, e.g. MMR vaccine and autism

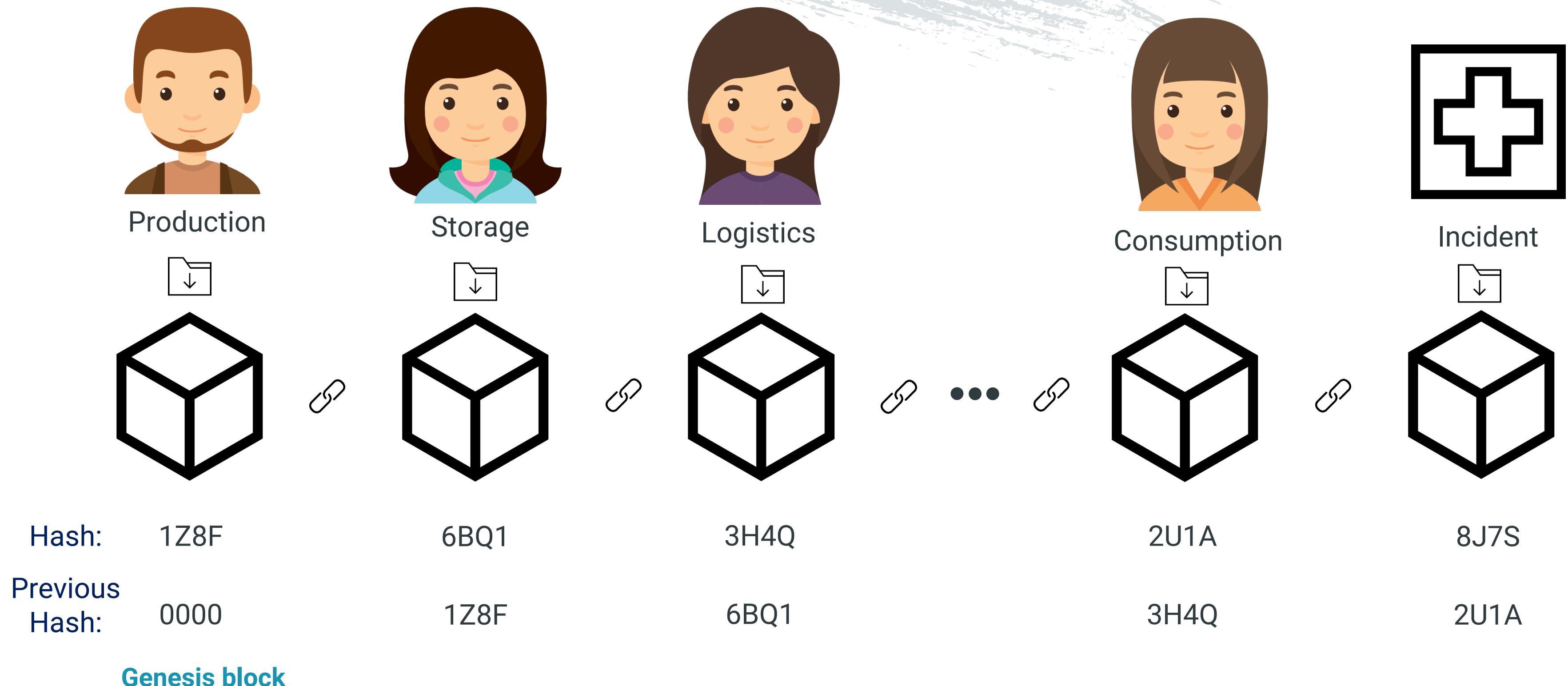
Negative sign to the entire health system

>100,000 deaths from the disease around the world each year, mostly in India and sub-Saharan Africa, where children rarely receive vaccinations for it



MED | CHAIN

HOW DOES IT WORK?

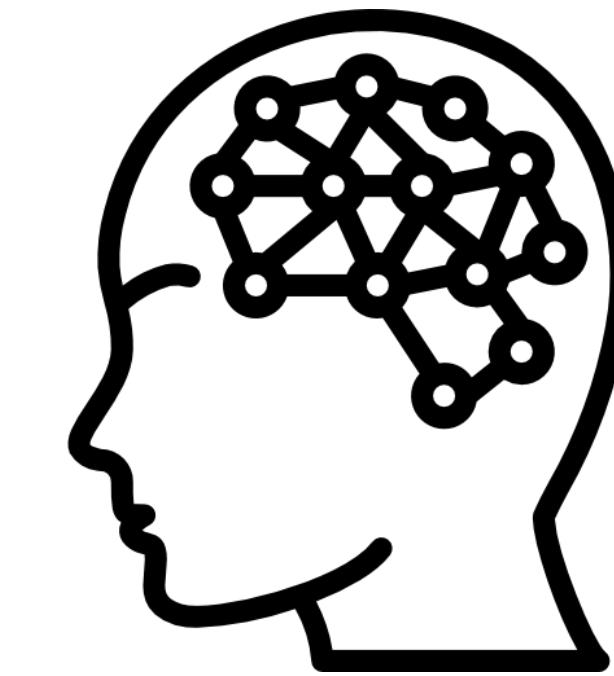
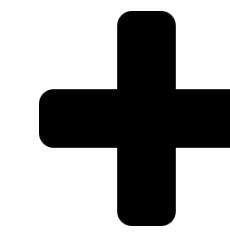
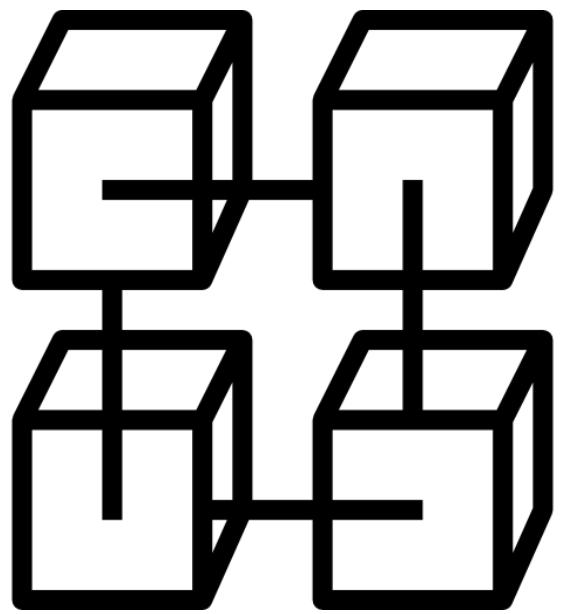
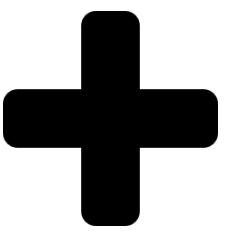


The whole life cycle of a medicine

**“APPLY BLOCKCHAIN TECHNIQUE
TO EFFICIENT TRACE INFORMATION,
BUILD PUBLIC CONFIDENCE
ON TAKING MEDICINE”**

TECHNOLOGY





Augmented
Reality

Blockchain

Computer
Vision



MEDCHAIN

IMMUTABILITY

Allow **high traceability**

More accurate to find out the real problem

Give **more suitable treatment** to patients

DECENTRALIZED

Data **retrieval rate** is significantly **faster** than traditional data storage

Fasten the investigation process

Quicker follow-up action on victims

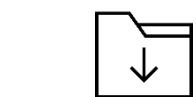
CRYPTOGRAPHICALLY SECURE

Only authorized users can access to the database

Give **rights and responsibility** for individual to take care of their health condition

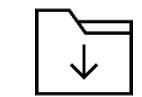
Help **gain back faith** of public on system

Production



| Vaccine_Info | |
|--------------|--|
| Vaccine_Name | |
| Vac_uniq_ID | |
| Manu_ID | |
| Ingredient_1 | |
| Amount_1 | |
| Ingredient_2 | |
| Amount_2 | |
| Ingredient_3 | |
| Amount_3 | |

Storage



| Storage | |
|----------------|--|
| Storage_ID | |
| Location | |
| Condition | |
| Temperature | |
| Humidity | |
| Warehouse_ID | |
| Warehouse_Name | |

Logistics



| Transportation | |
|-------------------|--|
| Transportation_ID | |
| Res_ID | |
| Shipping | |
| Land | |
| Air | |
| Packaging | |
| note | |
| Remarks | |

| Warehouse_company | |
|-------------------|--|
| Company_ID | |
| Name | |
| Remarks | |
| Ref_ID | |

| land_trans_company | |
|--------------------|--|
| Logistics_ID | |
| Company_ID | |
| Company_name | |
| Register_ID | |
| Register_year | |
| Incid_cases | |

| Logistics_company | |
|-------------------|--|
| Logistics_ID | |
| Company_ID | |
| Company_name | |
| Register_ID | |
| Register_year | |
| Incid_cases | |

| Shipping_company | |
|------------------|--|
| Company_ID | |
| Name | |
| Remarks | |
| Ref_ID | |

Distribution Channel



| Global_Distribution_cha | |
|-------------------------|--|
| Global_dist_ID | |
| Name | |
| Remarks | |
| Ref_ID | |
| follow_in_Country | |

| land_trans_company(2) | |
|-----------------------|--|
| Logistics_ID | |
| Company_ID | |
| Company_name | |
| Register_ID | |
| Register_year | |
| Incid_cases | |

| Sub_Channel | |
|-------------------|--|
| Channel_ID | |
| Company_Name | |
| Company_ID | |
| Channel_type | |
| follow_in_Country | |
| Country_Reg | |
| Contact | |

Consumption



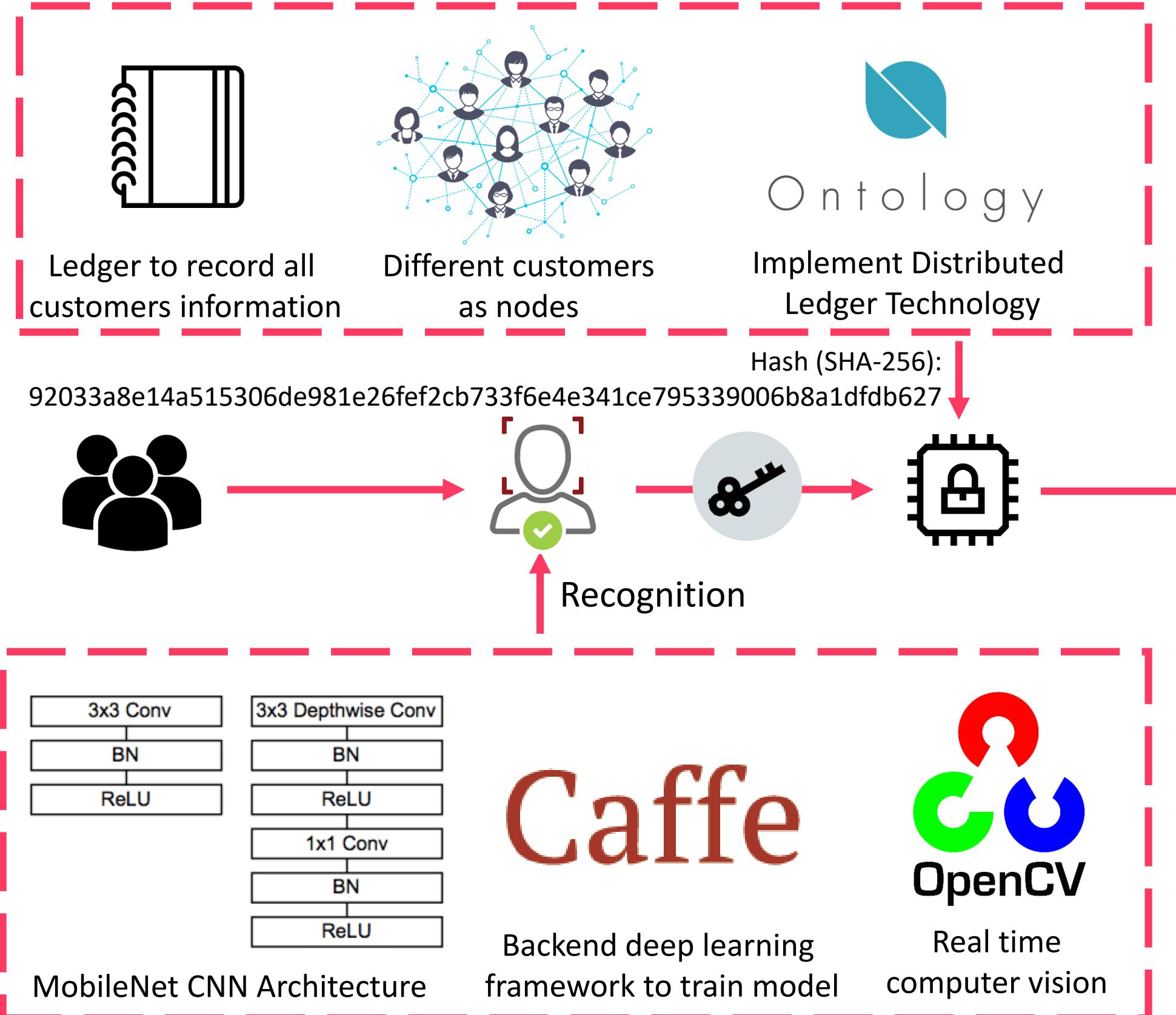
| Injection_record | |
|------------------|--|
| Injection_ID | |
| Vaccine_ID | |
| Hospital | |
| Clinic | |
| District | |
| Address | |
| Contact | |
| Contact_person | |

Incident



| Incident_Log | |
|--------------|--|
| Log_no | |
| SF | |
| Follow-up | |
| Related | |

Blockchain



Computer Vision

Big Data Analysis



Augmented Reality

BUSINESS STRATEGY



IMPORTANT STEPS

- Involve many stakeholders
- **Government support** is an initial and critical step
- Social responsibility

KEY STEP 1



01

Collaboration with public hospitals
Gain support from different stakeholders along
the medicine life cycle

- Digitalization takes time and high cost
- But, it is the future trend



KEY STEP 2



02

Digitalize data
Establish blockchain system

- Main income source
- Attract business cooperation opportunities

KEY STEP 3

03

Big data
Collaboration with medical authorities
on further development and research

A photograph of a young woman with long brown hair, smiling warmly at the camera. She is wearing a white long-sleeved shirt over a patterned vest. Her right arm is bent, and she is holding a clear plastic bag. The background is a bright, possibly sunlit interior.

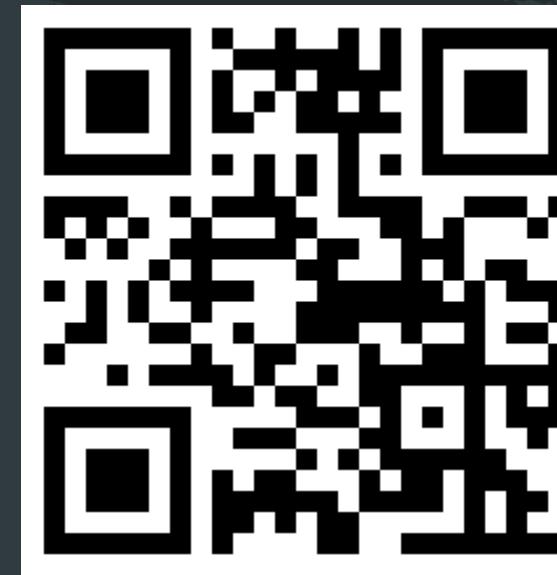
**TO INSPIRE A CONSCIOUS
LIVING FOR ALL**



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