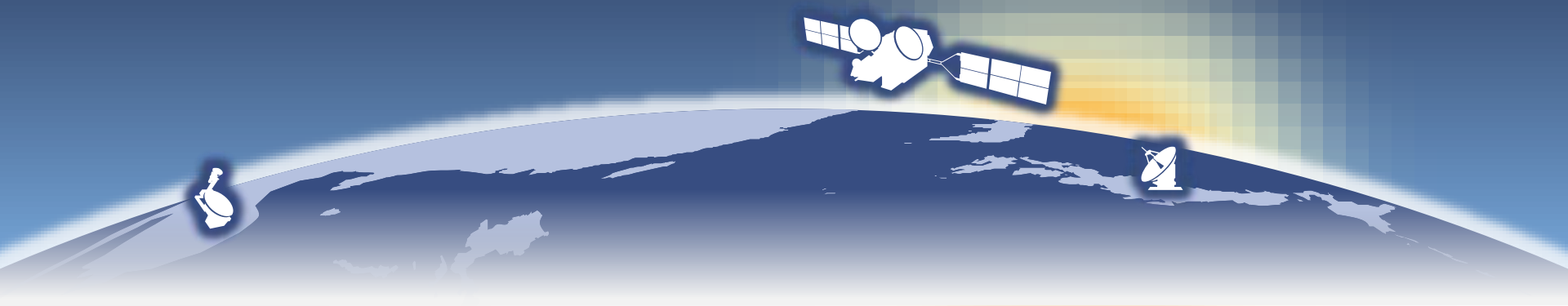
Study on optimum healthcare service provision for achieving universal health coverage using the leading-edge information science and technology of Japan



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What is Universal Health Coverage (UHC)?

"State in which everyone can have access to appropriate health service whenever necessary without economic difficulties."

Need of UHC

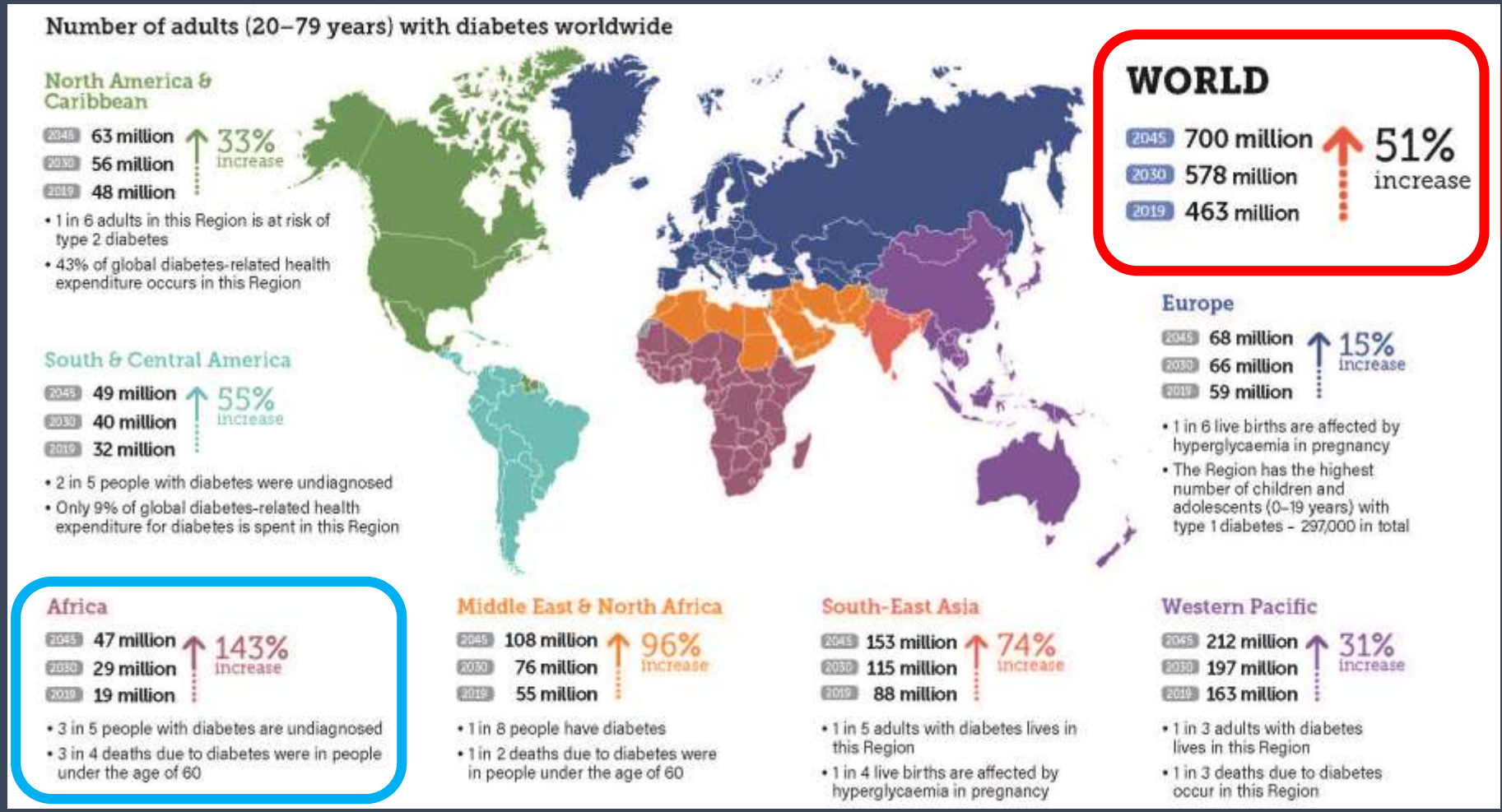
- One billion people do not have access to basic health service and many people would suffer financial hardship to obtain such basic health service.

Cited from: http://uhcday.jp/

Under such a situation, we are acting to
"Prevent lifestyle related diseases all over the world".

Changes of diseases

- Infectious diseases → Lifestyle related diseases
  A drastic increase in lifestyle related diseases is accompanying economic development.
- By 2045, the diabetes population will increase by 700 million in the world.



International Diabetes Federation. *IDF Diabetes Atlas, 9th edn*. Brussels, Belgium: International Diabetes Federation, 2019.

Present situation

Map Prevalence of diabetes in adults (20–79 years) in IDF Regions, by age-adjusted comparative diabetes prevalence

North America & Caribbean
2045 13.0%
2030 12.3%
2019 11.1%

South & Central America
2045 9.9%
2030 9.5%
2019 8.5%

WORLD
2045 9.6%
2030 9.2%
2019 8.3%

Middle East & North Africa
2045 13.9%
2030 13.3%
2019 12.2%

Africa
2045 5.2%
2030 5.1%
2019 4.7%

Europe
2045 7.8%
2030 7.3%
2019 6.3%

Western Pacific
2045 12.8%
2030 12.4%
2019 11.4%

South-East Asia
2045 12.6%
2030 12.2%
2019 11.3%

For confidence intervals, see full *IDF Diabetes Atlas*, Table 3.4.

However, many countries have neither an established health testing system nor sufficient specialists.
Many patients are left unaware of their disease.

Present situation and issues

Everyone

(Who is covered?)

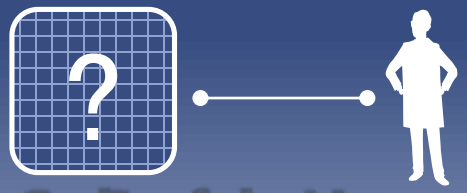
Difficult to provide high-quality service to some, such as those living in remote. area

Ex: A patient living in a remote area (half-day trip to a hospital) may arrive in a severe condition due to the poor access.

Low cost

(For what should the patient pay?)

Need of easy accessibility to necessary health service.



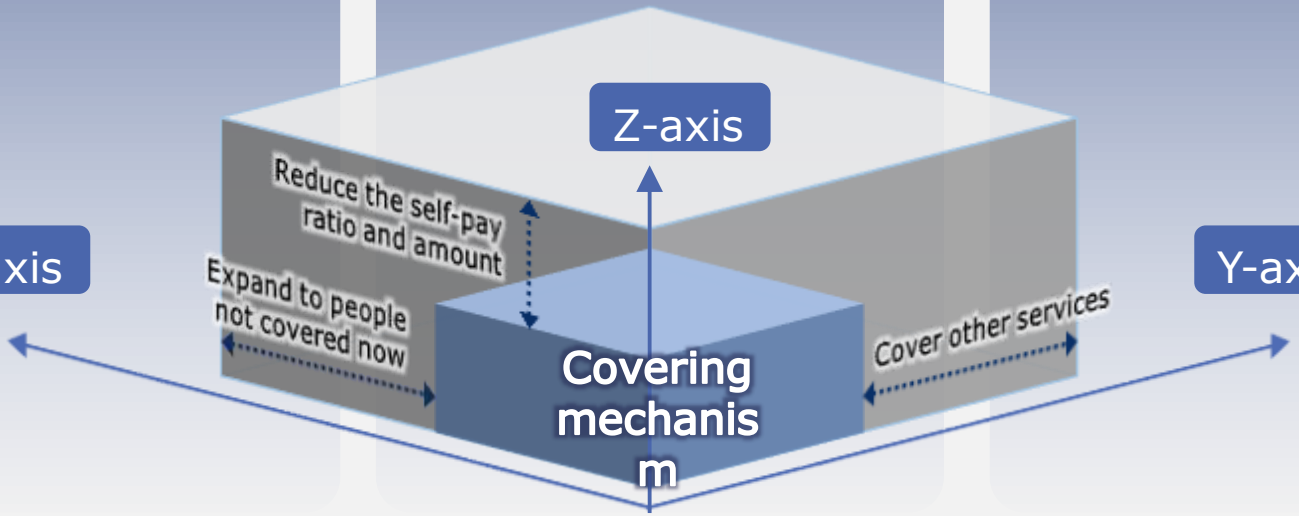
Ex: Quality of physician differs between urban and local districts, requiring human resource cultivation.

Diverse service

(What services are covered?)

New health services are needed due to increases in lifestyle related diseases.

Ex: **Patients with lifestyle related diseases** increase due to rapid economic development.



Solutions toward UHC

Everyone

(Who is covered?)

Difficult to provide high-quality service to some, such as those living in remote. area

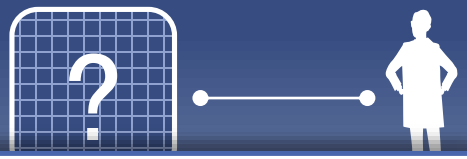
Solutions

Establishment of health service using satellite and mobile communication

Low cost

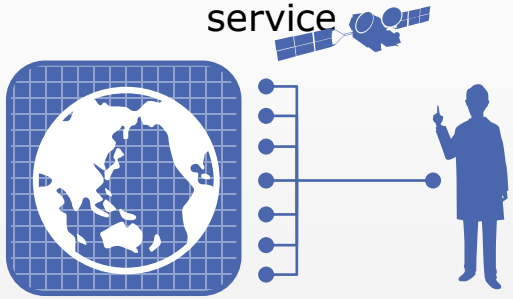
(For what should the patient pay?)

Need of easy accessibility to necessary health service.



Solutions

Providing everyone various services would decrease incremental cost for each service



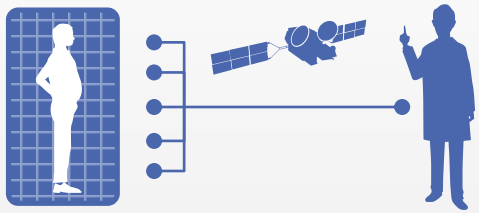
Diverse service

(What services are covered?)

New health services are needed due to increases in lifestyle related diseases

Solutions

Development of terminals and system for collecting and monitoring bio-information on preventing lifestyle related diseases and supporting diagnoses
Development of device for surveying physical activities, and preparation of physical activity guidelines



Study is conducted for efficient provision of health care service demanded by using information collected via a positioning satellite and other leading-edge technologies in Japan.

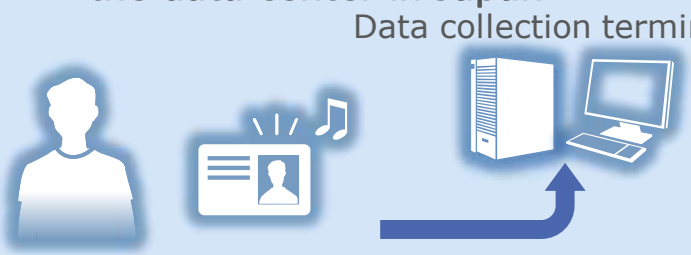
Summary of experimental results

Vietnam

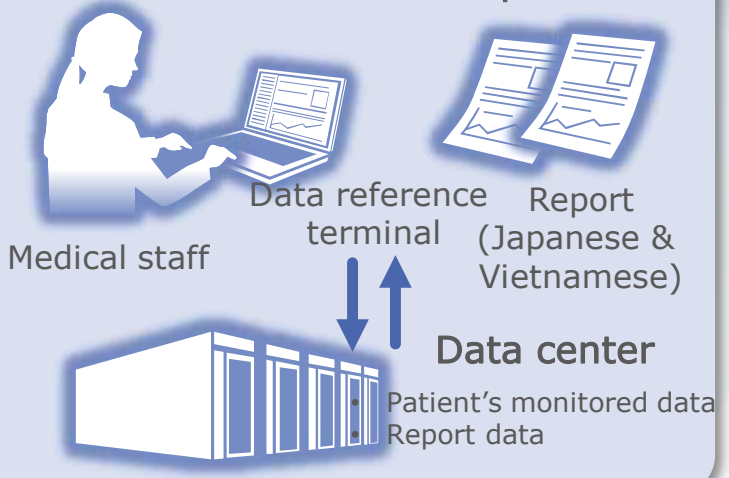
Japan

National Center for Global Health and Medicine

1 Send patient's monitored data to the data center in Japan



2 Refer to patient's monitored data Write and translate a report



3 Refer to patient's report

We constructed 1 2 3 and checked that 1 2 3 mutually coordinated correctly.

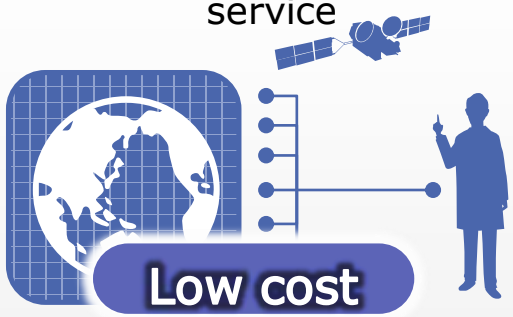
We verified **Everyone** can use **Diverse** services **At low cost** meeting the three axes of UHC.

Experimental results and actualization of UHC

The experiments showed a possibility of actualizing UHC.

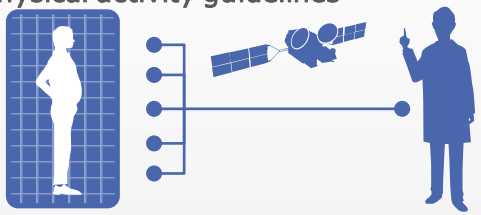
Establishment of health service using satellite and mobile communication

Providing everyone various services would decrease incremental cost for each service



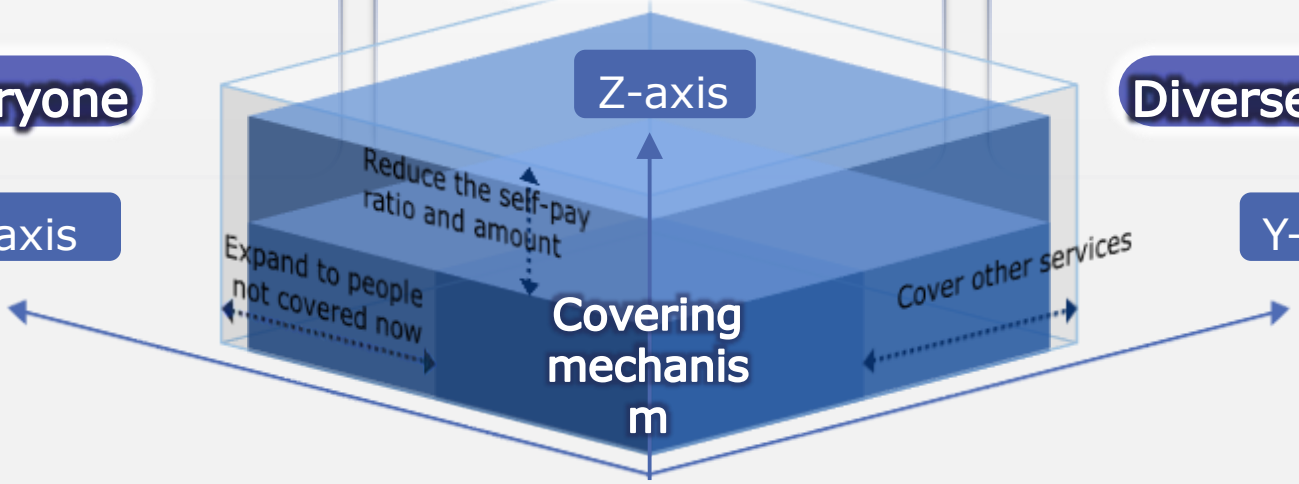
Low cost

Development of terminals and a system for collecting and monitoring bio-information for preventing lifestyle related diseases, and supporting diagnosis
Development of device for surveying physical activities, and preparation of physical activity guidelines



Everyone

Diverse service



Advantages of using communication satellite

⊖ Wide range

・Waves from a satellite reach a large area of the earth. A satellite can thus cover a large area and a wide range of services.
→ It is especially effective for urgently sending.

⊜ Simultaneous and multiple accessibility

・Data can be received at or sent from many stations simultaneously.
→There are many areas where transportation and communication accesses are difficult. Information on many patients with lifestyle related disease in such an area can be controlled simultaneously without the number of patients affecting the cost.

⊛ Quick and flexible network setting

・Network can be set quickly at any place just by moving an earth station.

④ Low cost

・In the range covered by a satellite, the data transfer cost is uniform regardless of the terrestrial distance. Thus, satellite communication becomes economical for communication between remote places.

⑤ Security

・Communication is allowed only between registered parties. It is safer and more reliable than the terrestrial channel.

Accelerate UHC