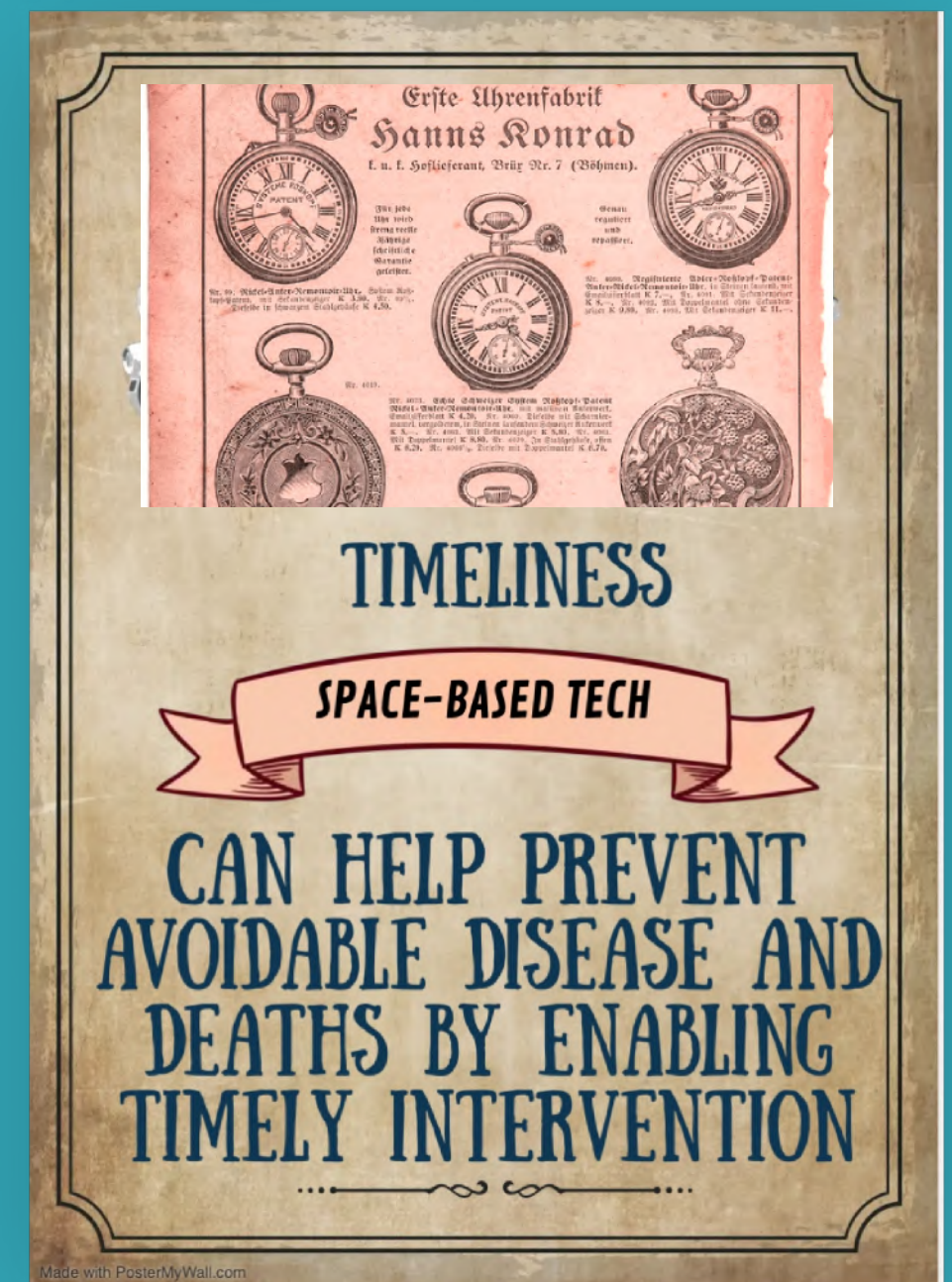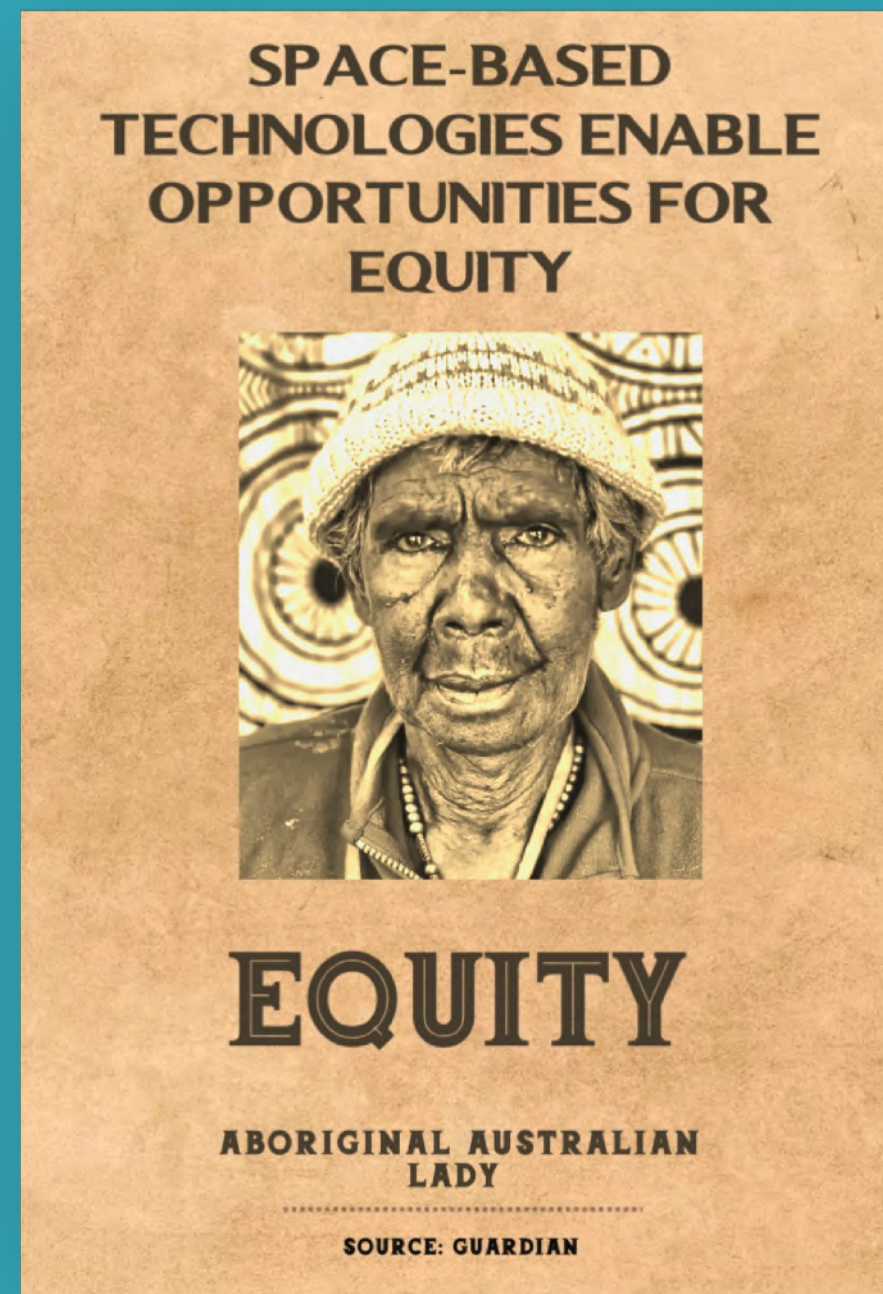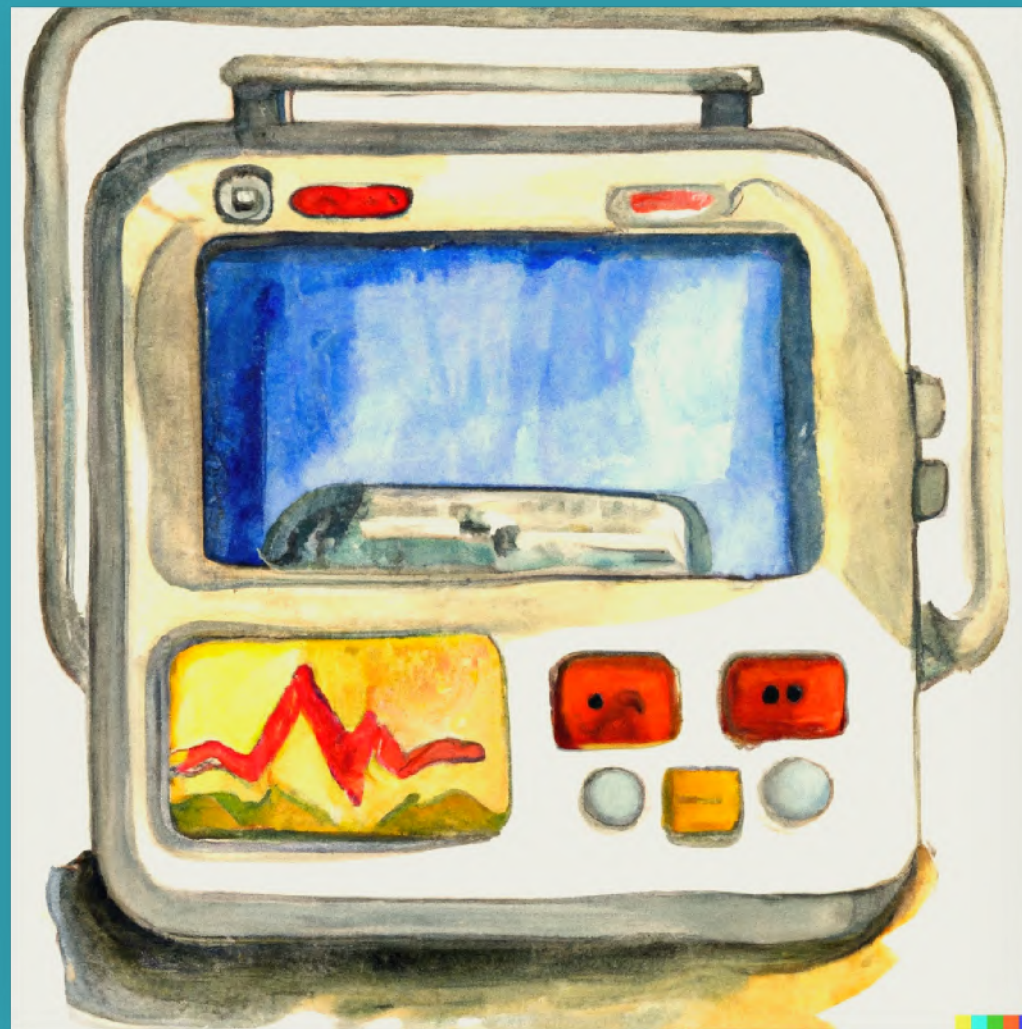# Digital Health: The Space against Time

Pitch

Healthcare Credos

Any technology – Digital or Space – to be an **enabler. One that strives to advance the credos for healthcare –** Availability, Accessibility, Equity and Timeliness

SPACE CAN AID HEALTHCARE
ACCESSIBILITY AND AVAILABILITY

REMOTE ACCESS
AVAILABLE

SPACE-BASED
TECHNOLOGIES ENABLE
OPPORTUNITIES FOR
EQUITY

EQUITY

ABORIGINAL AUSTRALIAN
LADY

SOURCE: GUARDIAN

Erſte Uhrenfabrik
Hanns Konrad

TIMELINESS

SPACE-BASED TECH

CAN HELP PREVENT
AVOIDABLE DISEASE AND
DEATHS BY ENABLING
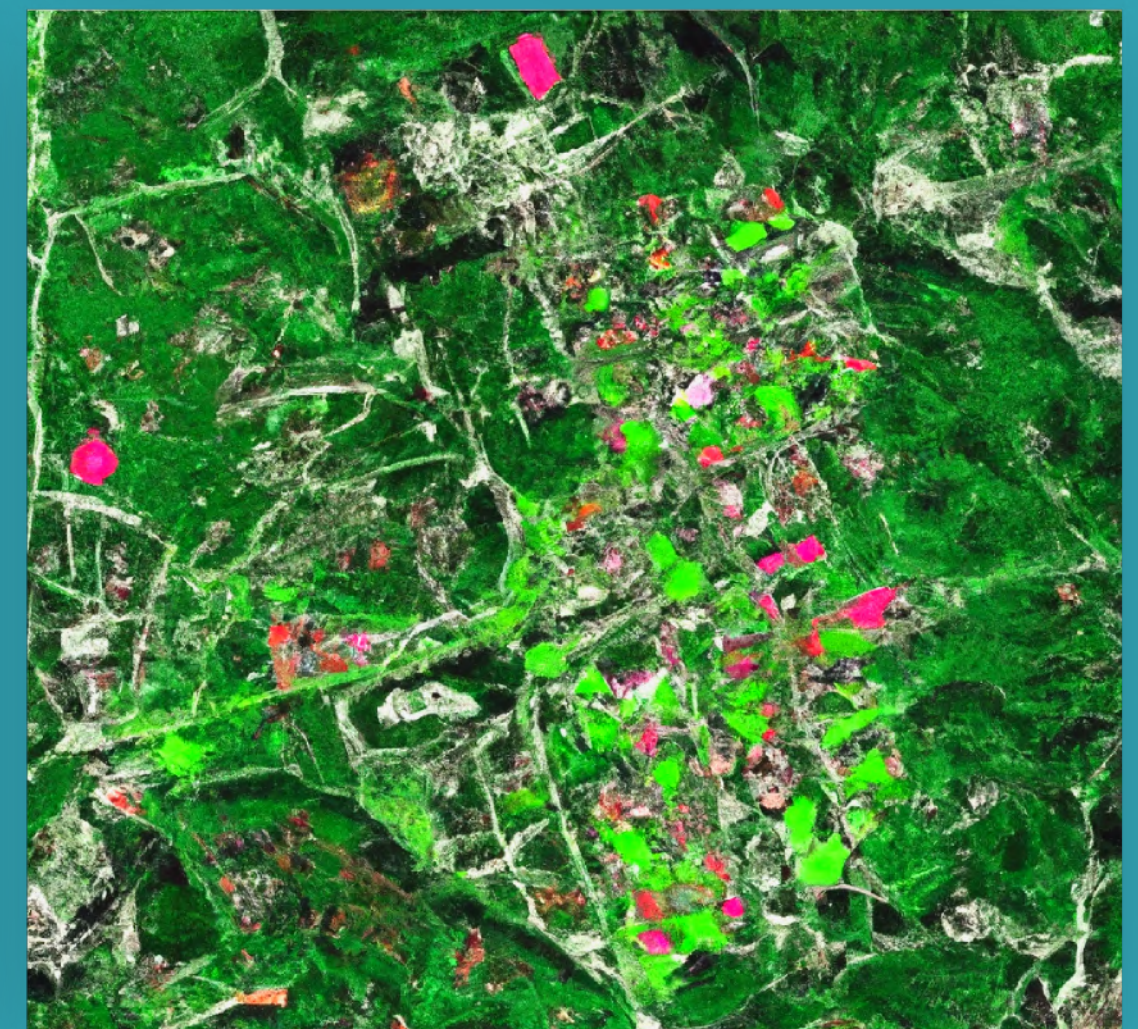TIMELY INTERVENTION

Novi Dewan

Pitch

[I] Space Technology in Covid-19

1) Tempus Pro, a telemedicine Device

2) B-LiFE, a Biological Field Laboratory

3) CEMS – Copernicus Emergency Management Service

Novi Dewan

Pitch

Tempus Pro, a Telemedicine device was loaned by the European Astronaut Centre ESA for 3 months to SEM*, Barcelona at the early peak of Covid-19

*SEM is Sistema d'Emergències Mèdiques Catalonia's Emergency medical service

Novi Dewan

1] Space and Covid: Tempus Pro

Doctors use Tempus Pro at the European Astronaut Centre in Cologne to
assess & communicate astronauts´condition upon return to Earth

- **Health Check for Thomas Pesquet with Tempus Pro**
- **Developed under ESA´s Business Application program**

Testing and validation at two Argentinian Antartica bases – Carlini and Belgrano II where –35 degrees, rocky outcrops, 1300kms from South Pole, conditions analogous to moon

Novi Dewan

1] Space and Covid: Tempus Pro

Emergency responders in Barcelona employ two ESA-provided telemedicine devices in ambulances to triage and treat patients in the golden hour

Source: The European Space Agency

- Dual-use, light weight, portable
- Ultrasound, ECG, laryngoscopy
- Patient Vitals, heart rate, BP, temperature, respiration rate
- Secure satellite link for communication, iridium satellite antenna (see pic)
- Used in ambulance, 1 nurse, 1 paramedic
- Doctors/senior expertise remote, thus not limited to one vehicle, safe from Covid
- Nurse Borja in SEM working with Tempus says –
  - Simplicity, operability and connectivity
  - Size reduction better for hostile environments
  - Early, timely ECG crucial in saving patient life

Novi Dewan

B-LiFE, Biological Light Field Laboratory, which was deployed in Guinea during Ebola was deployed in Piedmont Italy during Covid

Novi Dewan

2] Space and Covid: B-LiFE in Italy

B-LiFE, the Biological Light Field Laboratory deployed in Piedmont, Italy to quickly test first responders for virus & Immunity during Covid-19
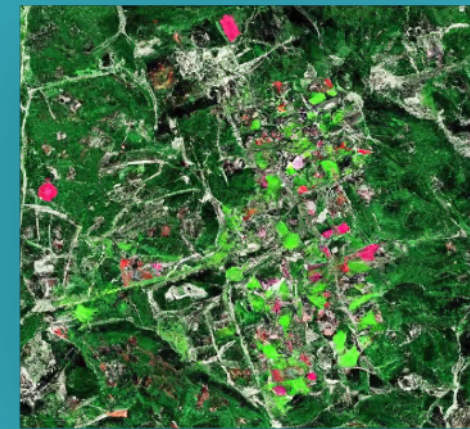

B-LIFE

- **Quick testing**, few hours vs. 24
- **Molecular testing**, virus and immunity
- Field laboratories critical, **strategically deployed at epicentres of crisis**
- **Fast turnaround** with collective data analysis onsite
- **Autonomous** from existing infrastructure
  - **Broadband Satellite** communication (field, control teams and experts)
  - **Earth Observation Data** for epidemiological maps
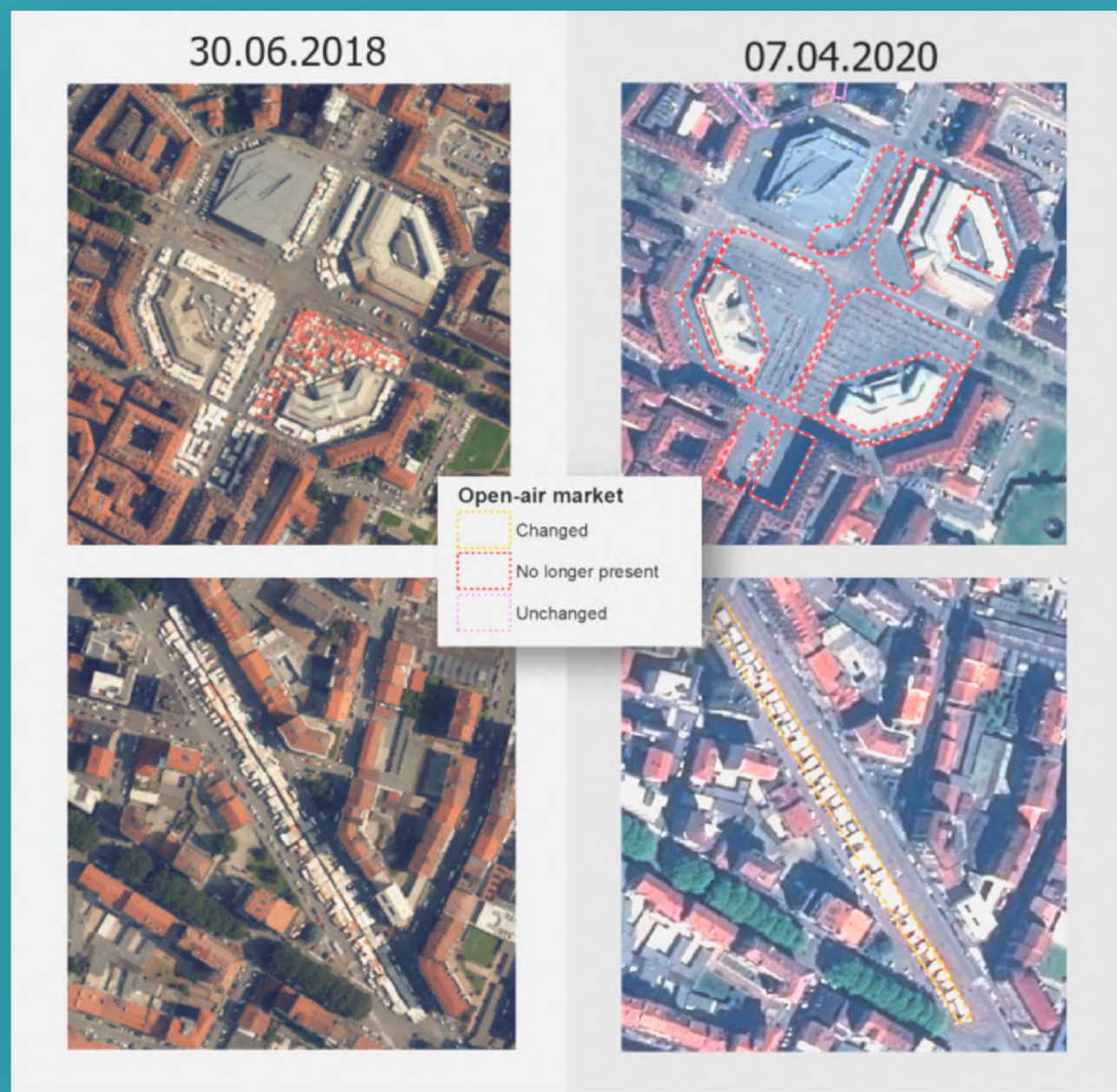 - **Geo-Location** to track teams, equipment, field samples

Novi Dewan

Pitch

ESA´s CEMS, Copernicus Emergency Management Service used in the health infrastructure mapping during Covid–19 in Turin, Italy

Novi Dewan

3] Space and Covid: CEMS in Italy

CEMS uses satellite imagery and geospatial data for mapping areas during disasters was used to support evidence-based decision-making during Covid-19

30.06.2018   07.04.2020

Open-air market
☐ Changed
☐ No longer present
☐ Unchanged

Temporary health facility
ⓣ New

- Activated by Italian Civil Protection Department 05.04.20
- 135,000 cases Italy by then
- Scope: Map and observe
  - public gathering places e.g. street markets and parks,
  - temporary health facilities e.g. tents & triage facilities
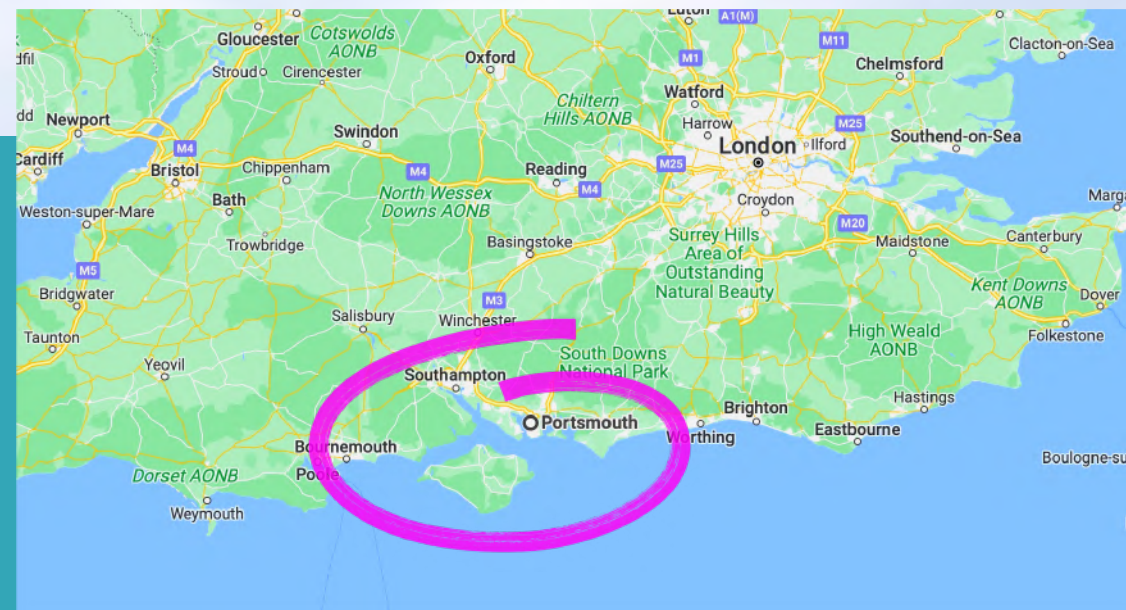- Objective: provide evidence to support decision-making

Source: The European Space Agency, Copernicus

Novi Dewan

[II] Space Technology: Other Cases

1) Drones to transport chemotherapy, Island of Wight, UK

2) Floating Hospitals in Bangladesh

Pitch

Source: NHS, SES Satellites

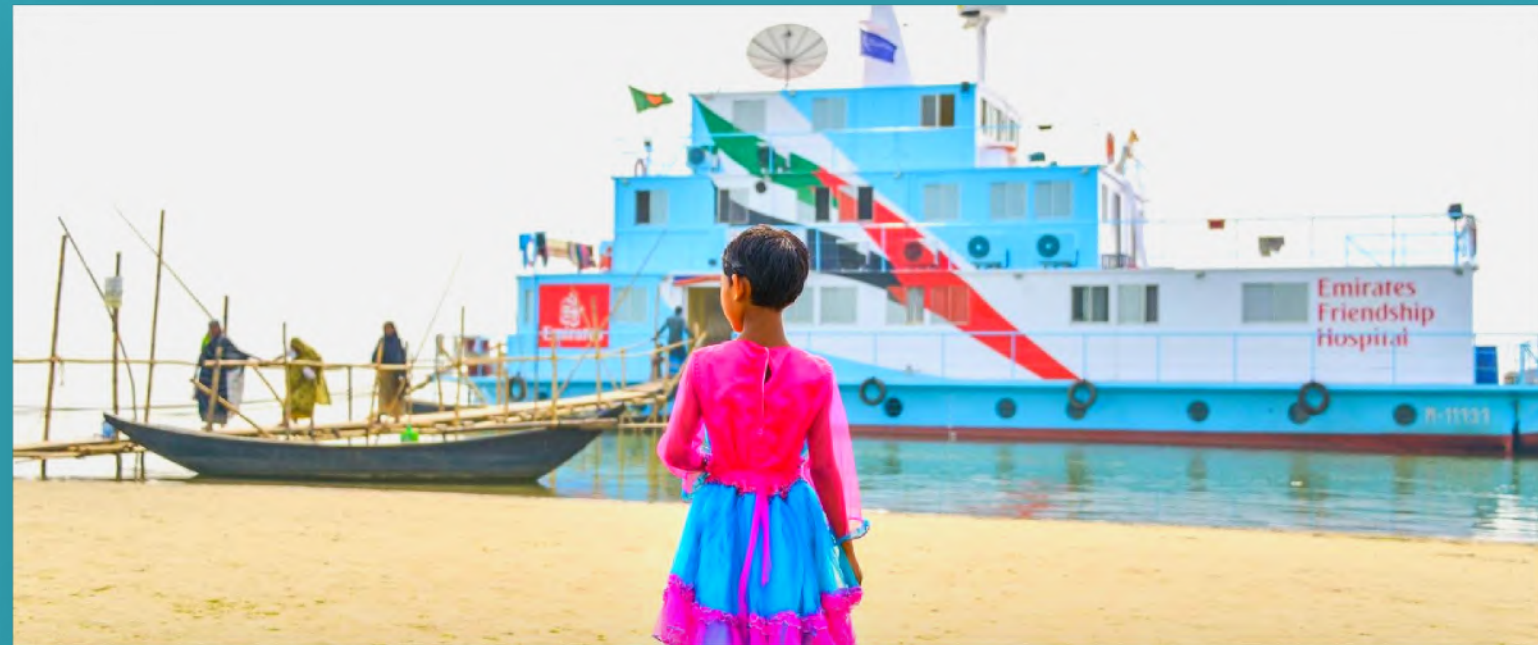Novi Dewan

1] Space for Chemotherapy

NHS uses electric drones or UAVs, with satellite secure air corridors, satellite enabled GPS to deliver chemotherapy drugs, cutting travel time to 30 min

- Bowel Cancer 2nd deadly cancer in the UK
- Chemotherapy from Queen Alexandria Hospital, Portsmouth to St. Mary's Hospital helipad, Isle of Wight
- Travel time cut from 4 hours (ferry, hovercraft) to 30 min
- Apian, NHS, UK Space Agency Public–Private Partnership
- Electric Drones weigh 85kg, wingspan 5m, carry to 20kg
- Matched with timely screening interventions: 67% up, kits sent home by Sheffield University annually
- Backed by UK Space Agency and ESA secure air corridors and satellite enabled GPS
- Also used for carrying Covid samples, test kits, PPEs

Novi Dewan

2] Space for Floating Hospitals

Luxembourg Government´s SES Satellites provided Maritime VSATs to Friendship NGO for 3 floating hospitals in the riverine of Bangladesh

- SES Satellites deployed 3 Maritime VSATs on 3 Floating Hospitals in Bangladesh
- SES also deployed its satellite-based e-health platform, SATMED aiding medical counselling to marginalised communities
- Telemedicine activities include e-care, e-learning, e-surveillance, e-health management, EMR and digital imaging.
- Success example of Public (SES), Private (Square Informatix, Bangladesh) and NGO (Friendship) partnership

Source: SES Satellites

Novi Dewan

Pitch

To Impact *Healthcare* Delivery – Truly The Sky or *Space* is the Limit!

Thank You for Your Thoughtful Attention and Kind Participation

Novi Dewan

Pitch