**How can the medical equipment manufacturers use the data regarding the number and distribution of patients in different countries in order to adapt their supply chains and transportation mechanisms?**

Medical equipment is key in dealing with the current situation. As there is a shortage of medical equipment, many manufacturers have dedicated production lines to produce these equipment. However, this does not guarantee that the shortage issue is fairly answered across the globe (we have all heard some not nice news about medical aid not arriving at their final destination...) The use of AI could aid in determining the future number of patients in different countries and predict the number of required medical equipment. This data can be used by manufacturers to have an idea on how many equipment is needed. Afterwards, through transportation, the medical equipment could be sent to the target countries. This solution could ensure that every human's life is treated equally. In addition, it can reduce the tension and stress on medical staff and allow them to concentrate on treating patients. Finally, by bringing different industries together, new business opportunities could be created. The challenge is then how can such a solution be realized? For this challenge the following specialists are required: 1. Medical staff 2. AI 3. Mathematic 4. Logistics 5. Transportation 6. Product design

**Problem Structure:**

1. Problem Owner: Government
2. Main Stakeholders: Manufactures & Hospitals
3. Problem Definition:
   1. Demand-based medical equipment distributions across Dutch provinces based on predictions. Predict demand based available data on:
      1. Current use of existing hospital health equipment/products
      2. Personnel
      3. Number of patients
   2. Identifying demands for different types of products in different regions:
      1. Insight into the list of products to focus on.
   3. Dynamic profiling location of hospitals & product type.
   4. Defining parameters for optimizing the transportation & logistics.
4. Focus Area:
   1. the Netherlands Healthcare Systems / Worldwide Manufactures
   2. Scale to global level HCS, if possible.

**Ideas**:

For problem d:

* Recommendation system for alternative manufactures in alternative countries based on parameters (e.g. distance, lead time, transportation facilities).

**Required Resources/Knowledge:**

1. Problem Definition:
   1. Demand-based medical equipment distributions across Dutch provinces based on predictions. Predict demand based available data on:
      1. Current use of existing hospital health equipment/products
      2. Personnel
      3. Number of patients
   2. Identifying demands for different types of products in different regions:
      1. Insight into the list of products to focus on.
   3. Dynamic profiling location of hospitals & product type.
   4. Defining parameters for optimizing the transportation & logistics.

Domain-related questions:

* What is medical equipment?
* What products are problematic or in shortage?
* Is there a prediction system in place for supply chain or number or number of patients?
* How is medical equipment allocated to different hospitals?
* How frequent is the order?
* How many and where are the manufactures in NL and worldwide?
  + What are these manufactures produce?
* How many non-medical manufactures are producing medical equipment? Which is the capacity?
* Which is the capacity of the inventories?
* How does the distribution system work? Is there a central point of storage?
* Which are the types of shipment?
* Which are the locations of the Dutch hospitals?

Data-related questions:

* Data related to hospital health equipment/products – personnel - #patients (a)
* Data on product demand and orders – transaction data.
* Based on statistics & reports, which are the products in highest demand? (b,c)
* Data on hospital locations.
* Connection lines – From manufacturer to inventories.