Vaccine Supply Chain Modeling: The HERMES Project
Create a **freely available** and **user-friendly software tool** for decision makers to generate an **interactive simulation model of any supply chain** (= a virtual laboratory).

**Data on Supply Chain Structure, Storage Locations, Transport, Capacities, Personnel, etc.**

**Standard input deck**

**Discrete event simulation model of supply chain**

**Economic Metrics**
- Total Costs
- Unit Costs
- Cost Drivers

**Supply chain performance metrics**

For more information, please visit: hermes.psc.edu
Example topics HERMES can address

- Introducing new vaccines and technology
  e.g., vaccines, storage
- Monitoring the health and status of the supply chain
  e.g. augment imperfect surveillance of the immunization program
- Altering characteristics of vaccines and other technologies
  e.g., vaccine vial size, vaccine thermostability, cold device capacity
- Changing configuration and operations of the supply chain
  e.g., storage, shipping frequency, personnel, ordering policy
- Differing conditions/circumstances
  e.g., power outages, delays, inclement weather, limited access
- Investing or allocating of resources
  e.g., adding refrigerators vs. increasing transport frequency
- Optimizing vaccine delivery
  e.g., minimize cost, cost per outcome, maximize immunizations
HERMES global work

2009
Formation of HERMES Logistics Team

2010
Thailand
- **Partners:** Prince of Songkla University and MOH
- **Evaluated:**
  - Impact of changing vaccine presentations
  - Impact of PCV and RV introductions
  - Impact of vendor-managed inventory system

Niger
- **Partners:** Niger Ministry of Health (MOH) and WHO
- **Evaluated:**
  - Impact of changing vaccine presentations
  - Impact of PCV and RV introductions
  - Impact of system redesign
  - Impact of thermostable vaccines
  - Impact of information system

2011
Senegal
- **Partners:** Senegal EPI Team and Project Optimize
- **Evaluated:**
  - Impact of changing vaccine presentations
  - Impact of PCV and RV introductions
  - Impact of Mobile Warehouse
  - In-country hands-on workshop

Vietnam
- **Partners:** Vietnam MOH and EPI Team and Project Optimize
- **Evaluated:**
  - Impact of changing vaccine presentations
  - Impact of PCV and RV introductions
  - Impact of system redesign
  - In-country hands-on workshop

2012
Passive Vaccine Storage Devices (PVSDs)
- **Partners:** Global Good
- **Evaluated:**
  - Potential designs and impact of PVSDs

Vaccine Supply Chain Re-Design
- **Partners:** Bill and Melinda Gates Foundation (BMGF) Co-Chair Meetings
- **Evaluated:**
  - Segmentation analysis of all GAVI eligible country supply chains
  - Potential supply chain redesign (simplification) in three sample countries

India (Bihar, Kerala, & Gujarat)
- **Partners:** INCLEN, ITSU, PHFI
- **Evaluated:**
  - Current UIP status
  - Impact of isolated and combined introduction Rotavac, IPV, PCV, and Pentavalent vaccines
  - Simple, Complex and Radical improvements

Benin
- **Partners:** Benin MOH, LOGIVAC Project (AMP and WHO), UNICEF, and PATH
- **Evaluated:**
  - Impact of system redesign
  - In-country workshops

2013
Decade of Vaccines Economics (DOVE) Collaboration
- **Partners:** BMGF, GAVI, WHO, UNICEF
- **Evaluated:**
  - Vaccine delivery costs in all GAVI-eligible countries

Kenya
- **Partners:** Kenya MOH and UNICEF
- **Assisted with:**
  - Development of GAVI HSS Proposal

2014
Mozambique (Gaza & Cabo Delgado)
- **Partners:** UNICEF and Village Reach
- **Evaluated:**
  - Current supply chain performance
  - Impact of system redesign

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Modeling Vaccine Supply Chains
Mozambique Workshop on Modeling and HERMES

The workshop provided the first step in capacity building and creating a local team of experts on the concept of modeling and the HERMES tool.

Participants included Ministry of Health national and provincial level, UNICEF, WHO, University of Eduardo Mondlane, VillageReach, and the HERMES Logistics team.
Sample HERMES publications

- **Introducing new vaccines and technology**
+ 3 more

- **Altering characteristics of vaccines and other technologies**
+ 2 more

- **Changing configuration and operations of the supply chain**
+ 2 more

- **Investing or allocating resources**
+ 1 more

- **Optimizing vaccine delivery**
HERMES graphical user interface (GUI)