

# **The impact of COVID-19 on global supply chains and the Critical Infrastructures: food and transportation in Sweden**

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# Interconnected Swedish infrastructures

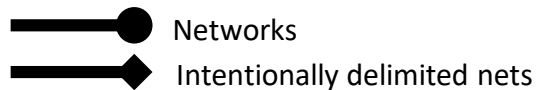
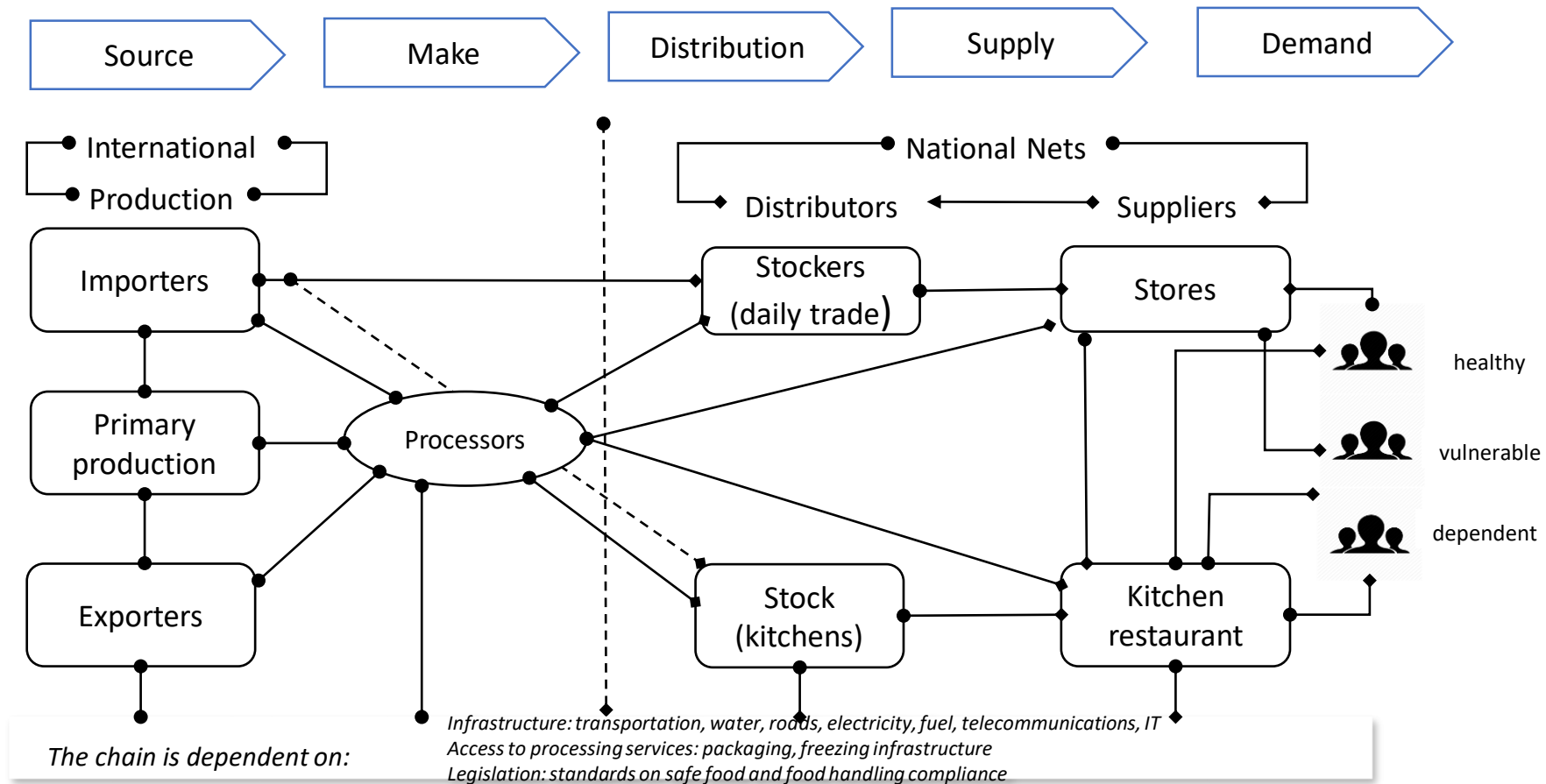
- Food supply and transportation are clearly essential sectors in a crisis
- “a decreased knowledge of cooking and food hygiene, especially for the young individual, and with about 60% of what Swedish people eat is imported, means declining “self-sufficiency” and increases import dependency and reliability on the transport sector” (The Swedish National Food Agency, 2016)
- Here, we show some of the features of the Swedish food and transportation sectors, and make some initial propositions regarding high level challenges in formulating a crisis response which addresses the interconnections between the sectors

# The food supply in Sweden

- The food supply in Sweden has a complex and multi-level structure when discussed in emergency preparedness.
- The food sector is a critical infrastructure in which numerous public and private buyers and suppliers collaborate on primarily a daily basis.
  - For example: food suppliers receive up to 1500 pallets of groceries, of which approximately 70% are supplied from central Europe and 30% from Sweden, and approximately 50 trucks leave one warehouse to deliver groceries to the local stores, every day
- The grocery flow from raw materials to finished food consists of many stages, and many players are significantly involved in foreign trade (i.e. import of foodstuffs, primary production, export, and processing).
- Important actors (i.e. buyers and suppliers at the national level) experience common challenges in coordinating their commercial activities

Elvira Kaneberg, (2018) "Managing commercial actors in strategic networks in emergency preparedness: A study of multiple networks from Sweden", Journal of Humanitarian Logistics and Supply Chain Management, <https://doi.org/10.1108/JHLSCM-05-2017-0018>

# The food supply chain in Sweden



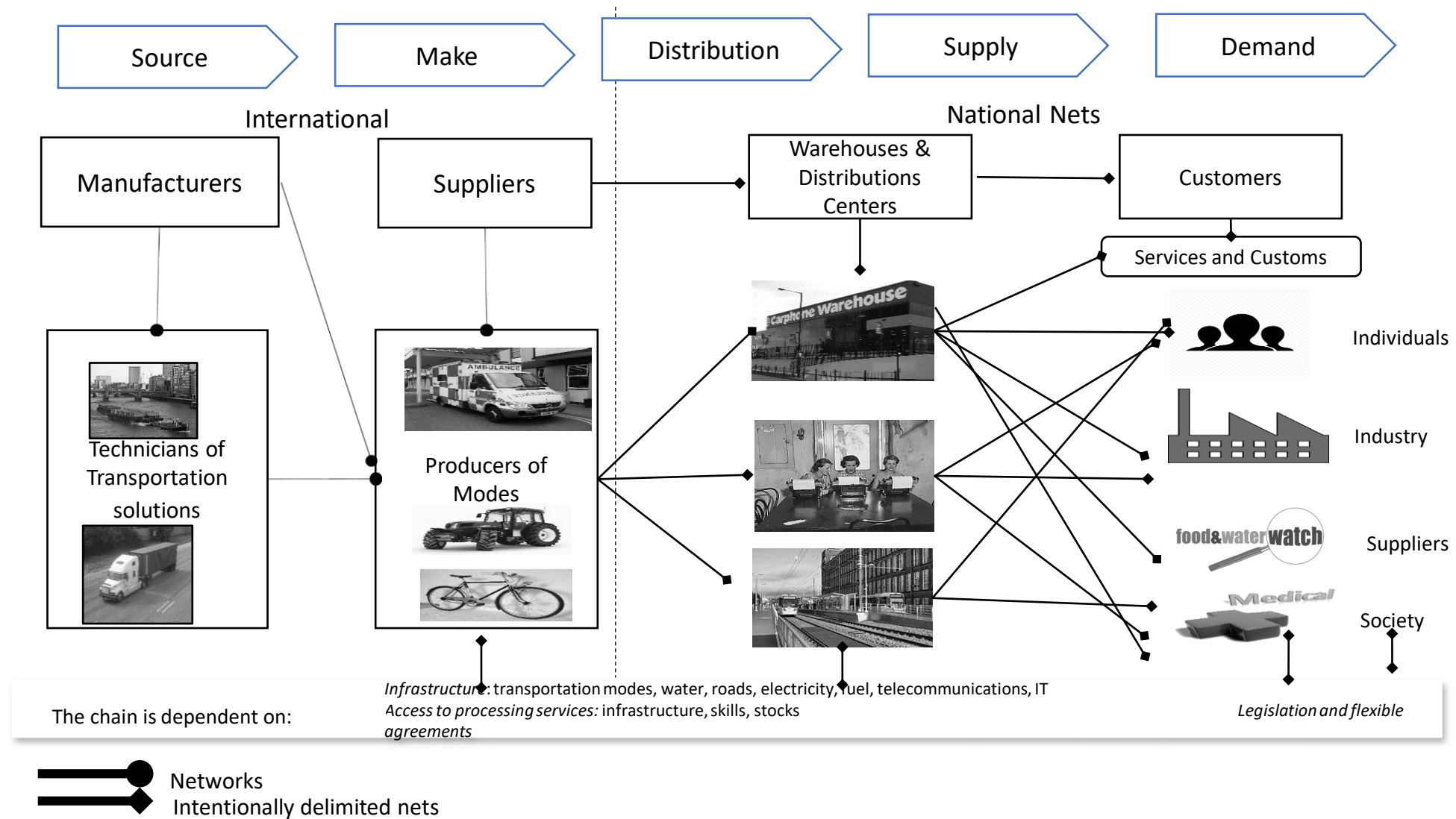
# The transportation infrastructure in Sweden

- The Swedish transportation sector represents a critical infrastructure, and managers at all levels are responsible for planning and securing the required transportation embedded in all supply chain sectors.
- Logistics service providers take on multiple roles in the transportation system
- Already Swedish transporters are experiencing serious problems in maintaining their business operations. (See e.g. [transportforetagen.se](http://transportforetagen.se))
- The transport supply chain in the following figure displays an example of a transport supply chain in relation to the international manufacturers and suppliers to ensure the national availability of all types of traffic, and for building, operating, and maintaining public roads and railways.

Elvira Kaneberg, (2018) "Managing commercial actors in strategic networks in emergency preparedness: A study of multiple networks from Sweden", *Journal of Humanitarian Logistics and Supply Chain Management*, <https://doi.org/10.1108/JHLSCM-05-2017-0018>

Jensen, L-M, (2010) "Opportunities and constraints for intermediaries in distribution: The challenge of variety," *IMP Journal*, Vol. 4, Issue 3, pp.194-219.

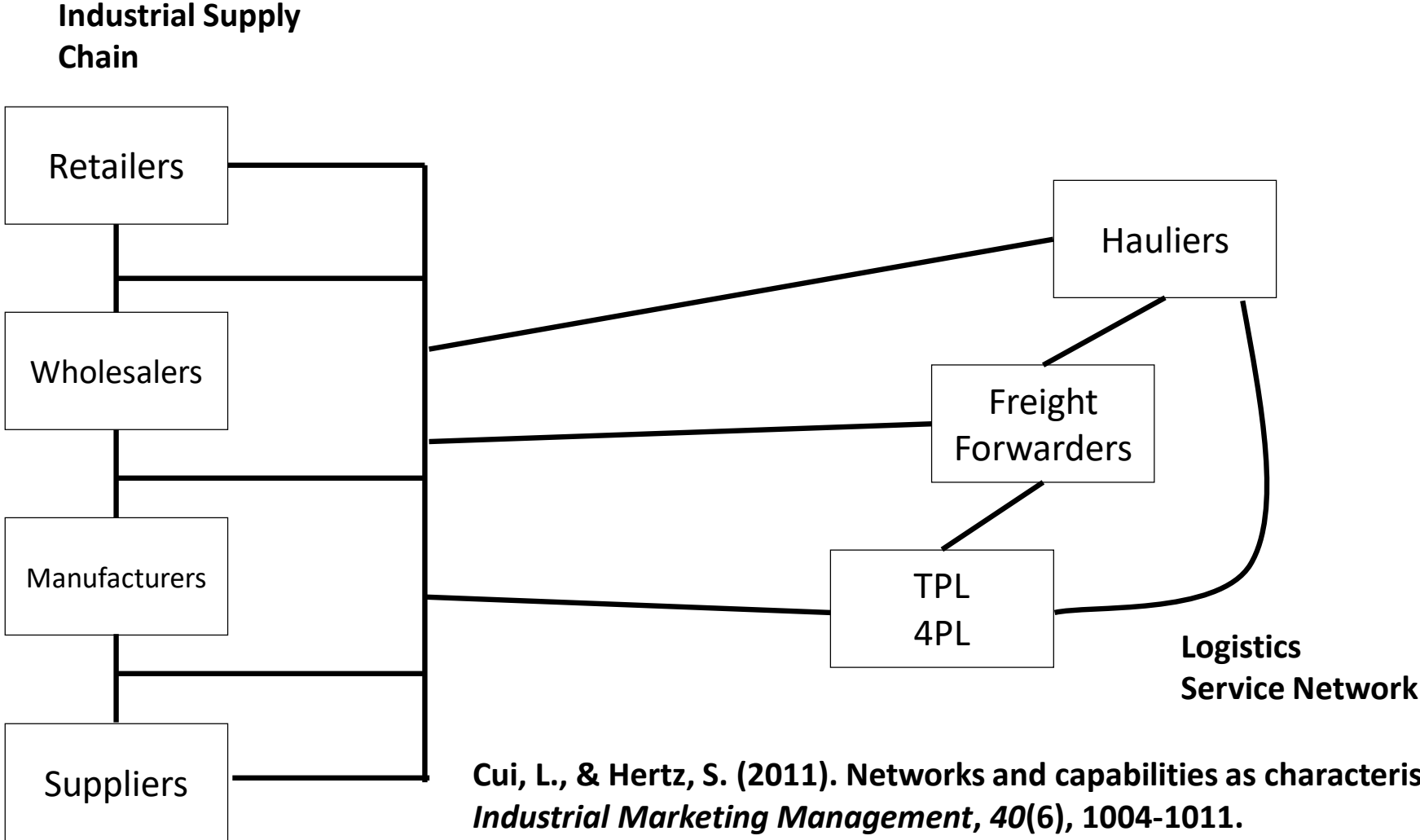
# The transportation Supply Chain in Sweden



# Linking the food supply chain and transport

- The food supply chain is closely integrated with the transportation network in many ways
- Preparedness in one cannot be fully effective without linking it to the preparedness in the other
- This means that preparedness is not just about the basic modes of transport, but that freight forwarders and LSPs should be included in preparedness as well
- The following figure summarizes the connections between the food supply chain and transportation providers, forwarders and LSPs in a logistics service network

# The food supply chain and the logistics service network: A «hidden» structure that impacts on emergency response





# There are several challenges for the integration of the Swedish food system and transportation in the current crisis

- In the short term the Swedish food system is set up to have buffers for only a few days
  - For example, ICA, and COOP are the largest private suppliers of food in Sweden, they own and control the largest, most fundamental food warehouses in Sweden, but, so far, they are not involved in the emergency planning
- In the longer term parts of the system remain crucially dependent on international supply chains
  - E.g. Personnel for harvesting
    - With Covid-19 restrictions the usual migrant workers that deal with much of the berry production may not be able to travel.
  - Feedstock for production

# Conclusions

- Tension in the response due to incomplete networks
  - To act effectively at all the complex networks have to be reduced to more strategic nets that do not try to cover everything
  - Even so there are large-scale dependencies between the food supply chain and the logistics service network
  - Strategic nets may cut across sectors leading to an even greater need to define and coordinate them before a response (e.g. in the planning phase)
- The integration of service providers (such as LSPs) in the preparedness is essential in modern complex supply chain for an effective response. For example should 3PLs be part of the capacity planning for transportation?
- We cannot consider critical sectors in isolation since they are closely integrated in networks, but it is still necessary to find mechanisms such as nets so that we do not have to consider all aspects of a response simultaneously