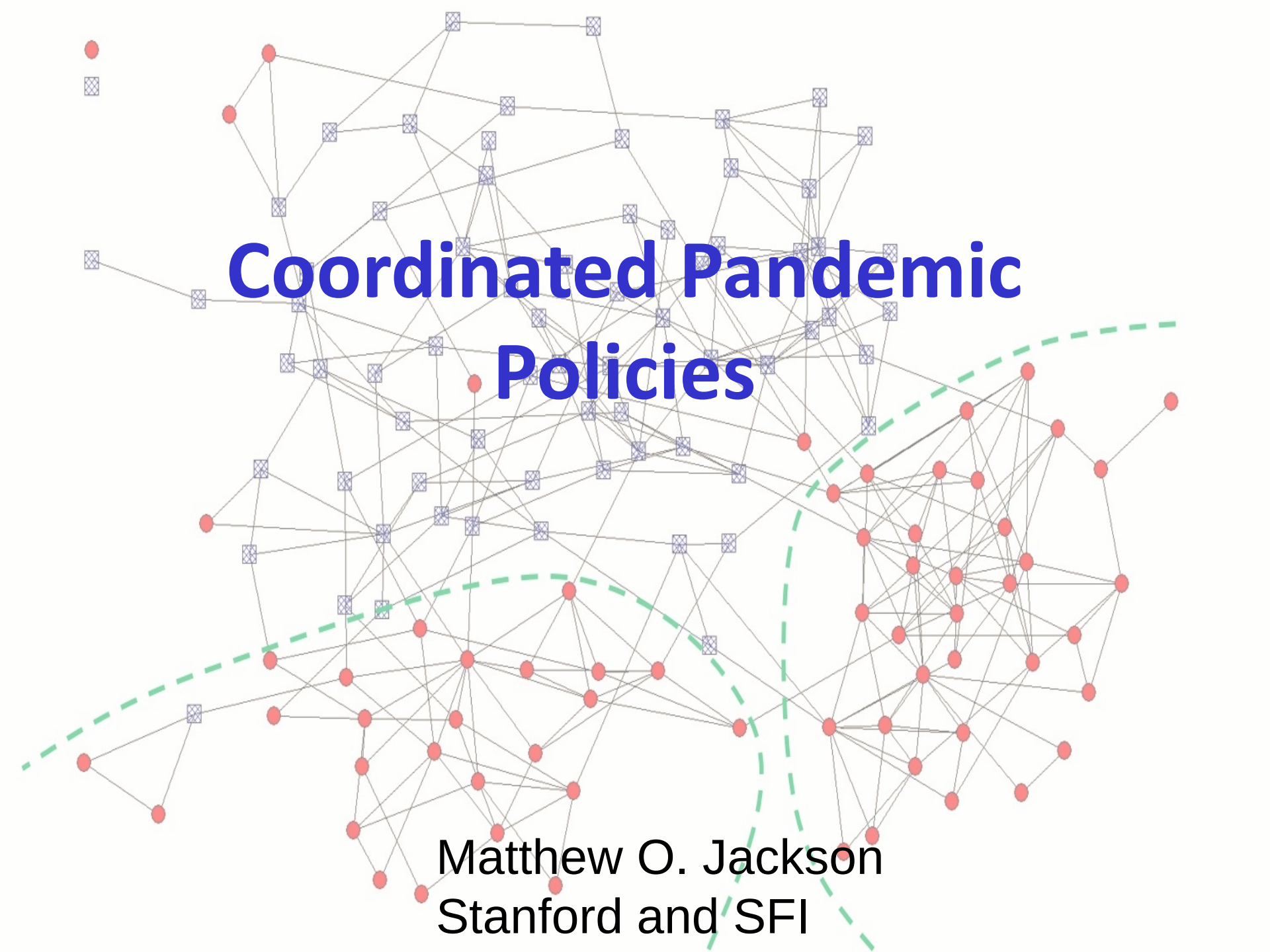
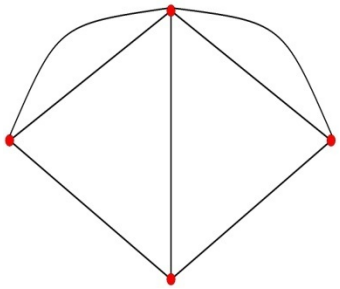


Coordinated Pandemic Policies

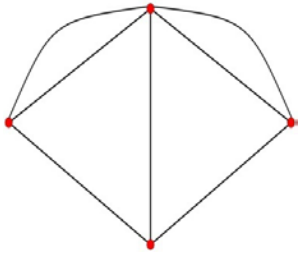
Matthew O. Jackson
Stanford and SFI

Human Diseases Eradicated



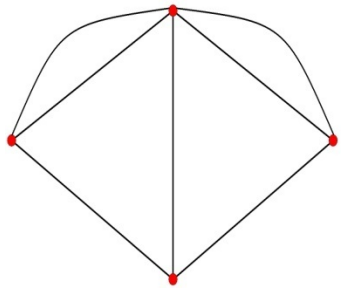
- Smallpox

Need for government



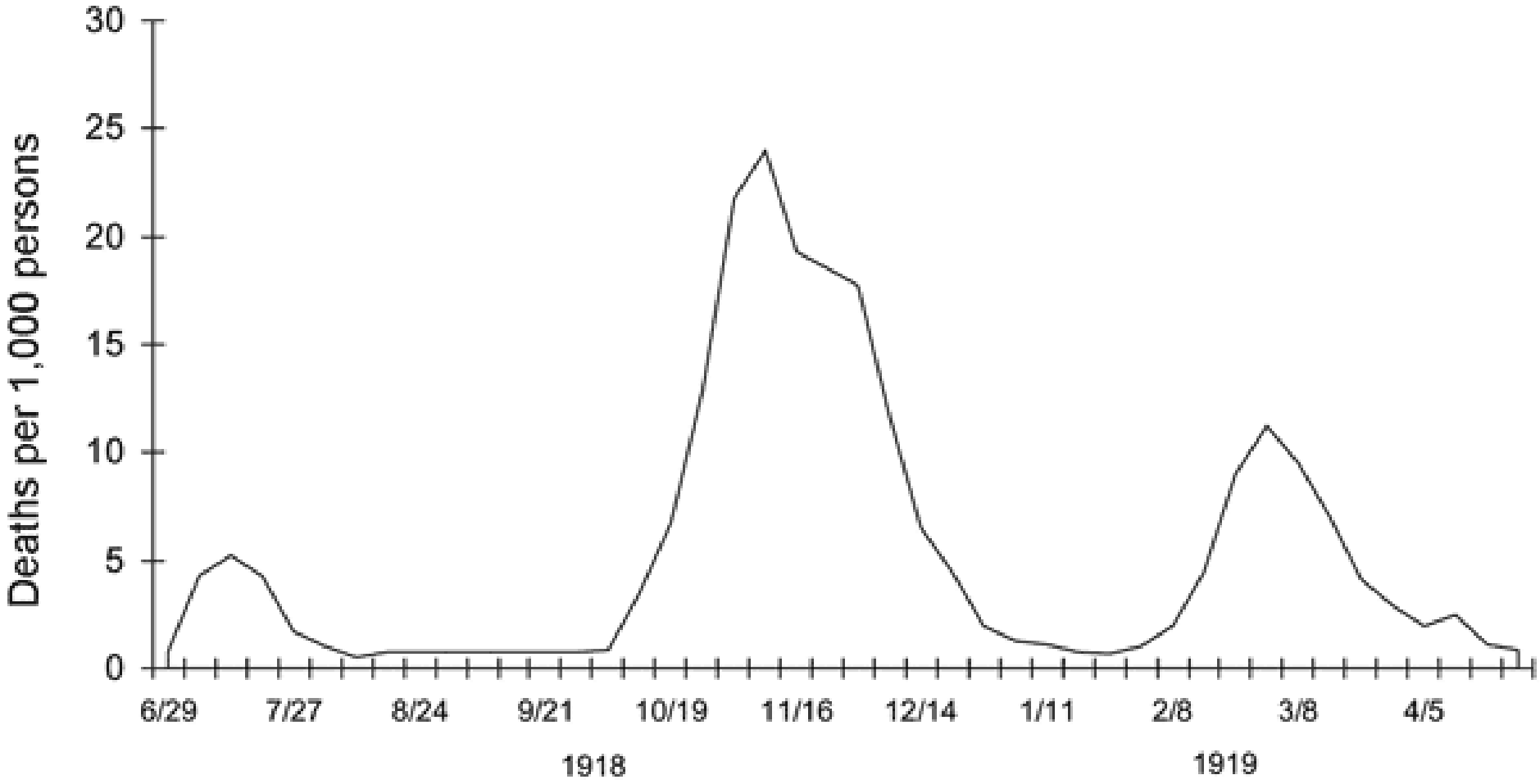
- externalities/underestimation of dangers
  - don’t (fully) account for others
  - don’t understand exponential growth
  - myopic – react to observed dangers
  - amnesia: forget lessons from past
  - herd mentality: false security of others not acting, live in bubbles...
  - disease can be partly/wholly asymptomatic

Coordination



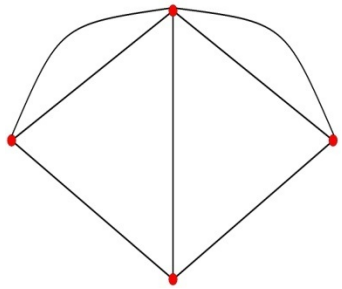
- Disease *will* recur
  - Avoid whack-a-mole across regions/countries

Resurgence:
1918 Influenza Deaths, UK



Taubenberger and Morens (2006)

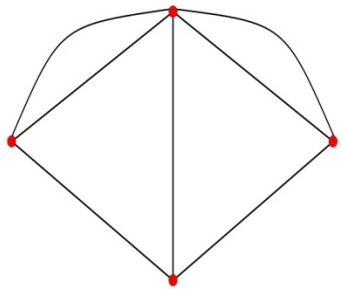
Coordination



- Disease *will* recur
  - Avoid whack-a-mole across regions/countries

- Interacting Complex Systems: Three Networks!
  - Pandemic
  - Businesses: supply chains matter...
  - Financial networks and defaults

Supply Chains



- Opening businesses needs to be coordinated
- E.g., Cannot produce medical supplies without key parts that might not otherwise look ``essential''
- Financial consequences

Matsuo (2015)
microcontroller unit production

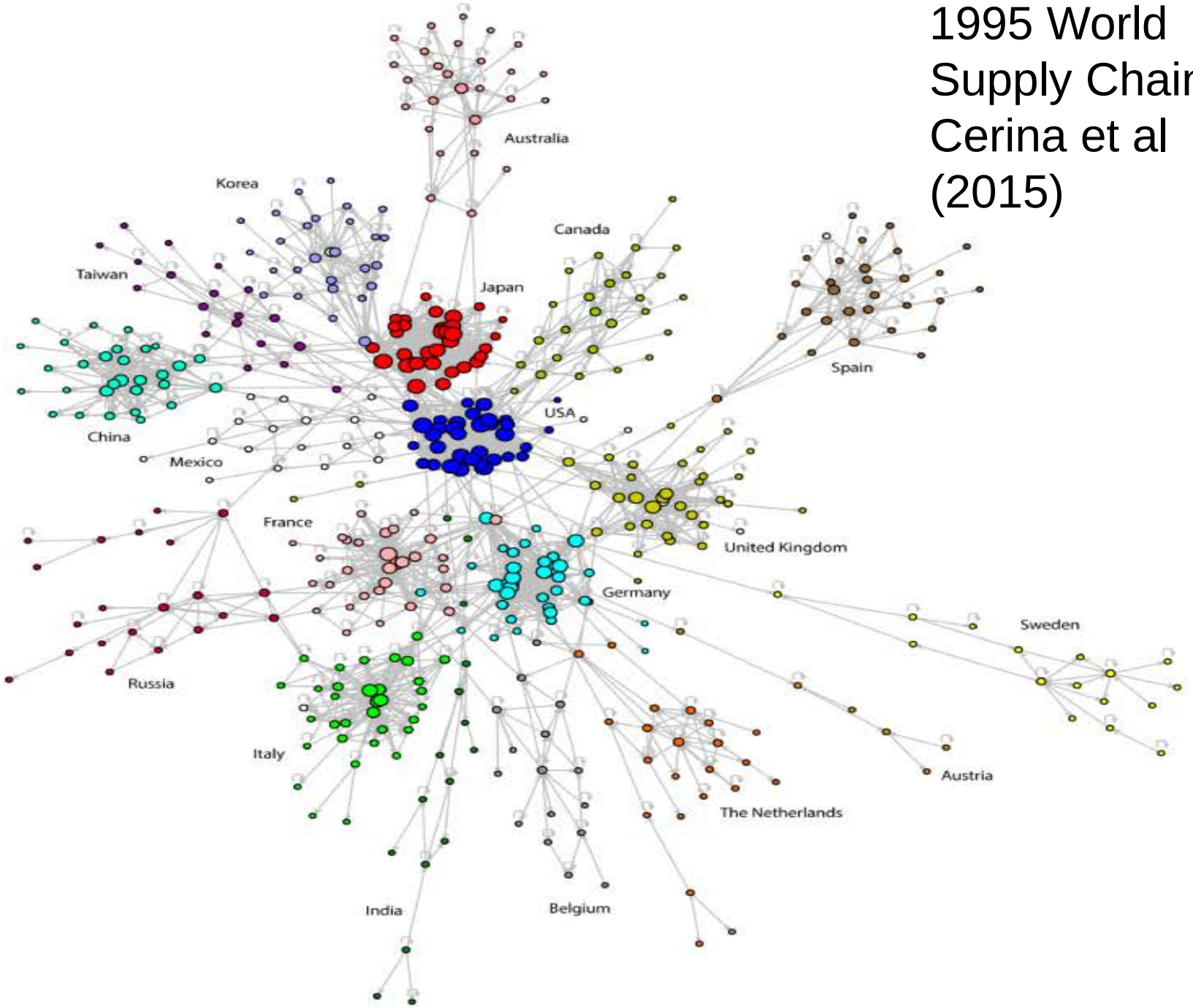
World-wide share of automobile MCUs.
(*Source*: HIS iSuppli).

44%	Renesas Electronics (Naka Plant: 20%)
22%	Freescale
9%	Infineon Technologies
7%	Texas Instruments
6%	Fujitsu Semiconductor
3%	ST Microelectronics
3%	Microchip Technology
2%	Toshiba
4%	Others

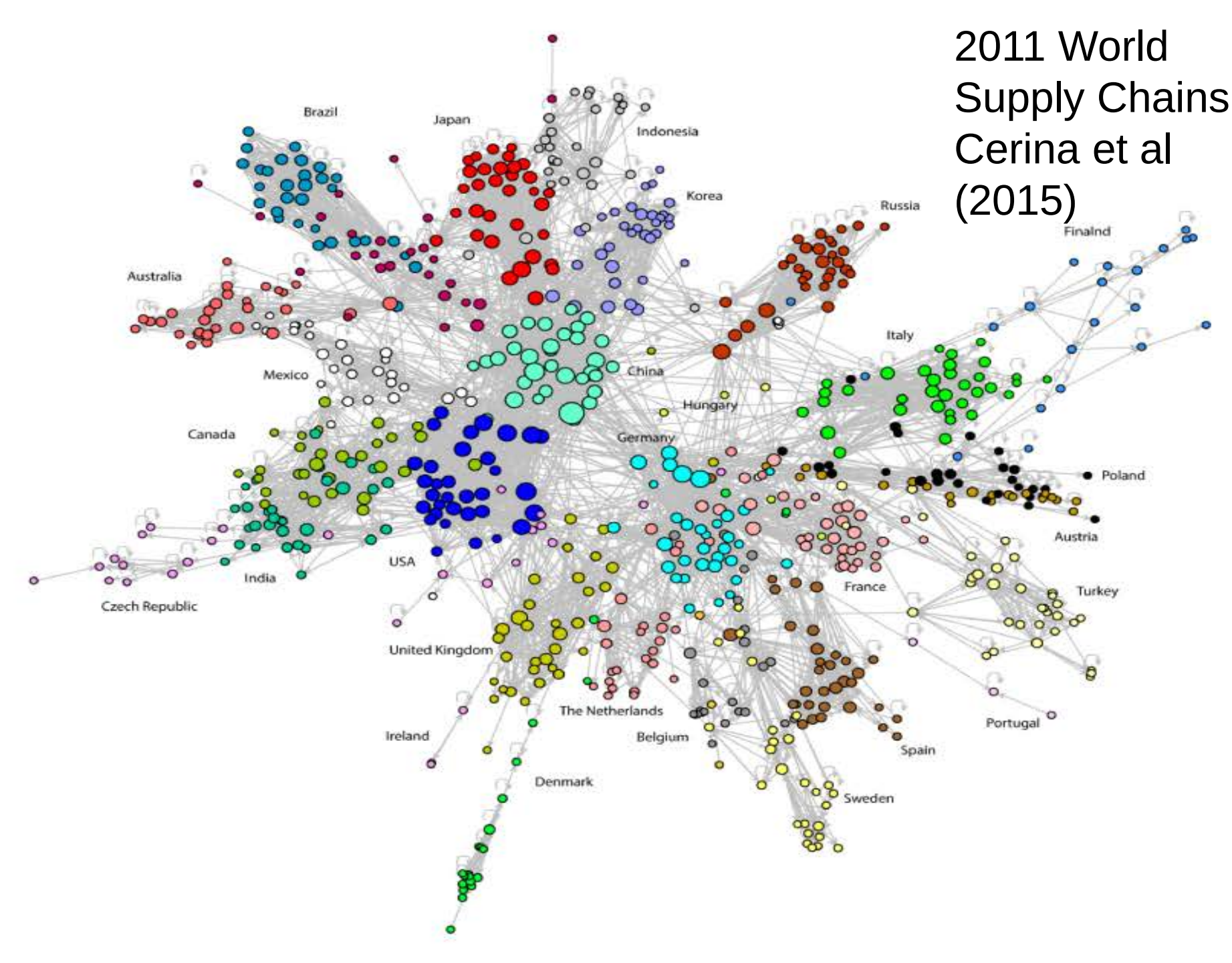
Matsuo (2015)

The percentage changes of cars produced domestically from the previous year.
(*Source:* The author created based on the data compiled by Japan Automobile Manufacturers Association, Inc.).

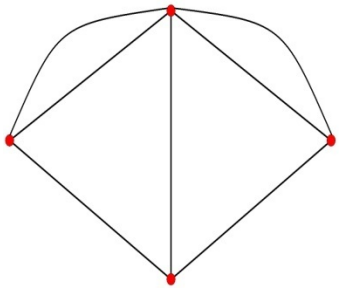
Year 2011	Toyota	Nissan	Mazuda	Honda	Japan Total
March	−62.7%	−52.4%	−53.6%	−62.9%	−57.3%
April	−78.4%	−48.7%	−49.7%	−81.0%	−60.1%
May	−54.4%	0.8%	−11.8%	−53.4%	−30.9%
June	−15.9%	1.9%	−2.3%	−50.6%	−13.9%
July	−12.5%	15.3%	−5.0%	−18.5%	−8.9%
August	11.9%	−2.5%	5.6%	−17.2%	1.8%
September	1.2%	−6.7%	−3.0%	−21.2%	−4.5%
October	33.5%	32.9%	−0.8%	18.3%	20.3%
November	5.1%	25.1%	1.6%	−37.8%	4.5%
December	16.7%	24.6%	−8.1%	10.8%	13.4%



1995 World Supply Chains Cerina et al (2015)


2011 World Supply Chains Cerina et al (2015)
Brazil
Japan
Indonesia
Korea
Russia
Finalnd
Australia
Italy
Mexico
China
Hungary
Canada
Germany
Poland
Austria
USA
India
France
Turkey
Czech Republic
United Kingdom
The Netherlands
Portugal
Ireland
Belgium
Spain
Denmark
Sweden

(Re)Opening

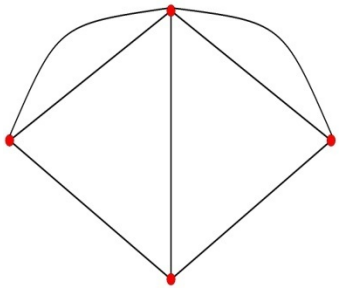


- ``Essential''

- Centrality: in interaction systems
  - disease
  - supply chain
  - financial

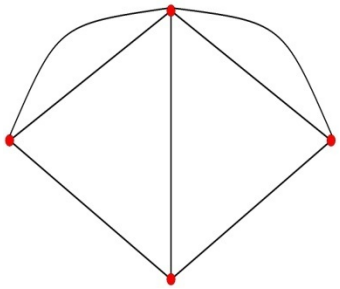
- *Coordinate whole supply chains, sustainably*

Multifaceted/Coordinated Policy



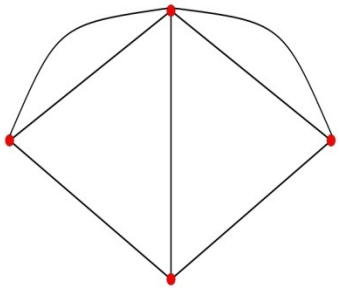
- I. Disease/Business Management
  - Information:
    - Education, propaganda
    - Extensive/strategic testing
  - Incentives:
    - Individuals: Tracing apps?
    - Firms: mechanism design - social benefits/costs
  - Coordinated and prioritized openings:
    - low disease/high business/high financial centrality
    - whole supply chains

Multifaceted/Coordinated Policy



- II. Government Aid: *New New Deal*
  - Demand
    - displaced workers
    - info: avoid panic/hoarding/spending freeze
  - Supply
    - equity and forgivable loans
    - by centrality, by chains
  - Financial networks
    - anticipate business, consumer, country defaults
    - inject capital via central nodes

Coordination



- Between governments

- Complex interacting systems - Three networks:
  - disease
  - production
  - financial