Challenges and strategies for Information Systems in the decision-making process to face the COVID-19 pandemic: The São Paulo case

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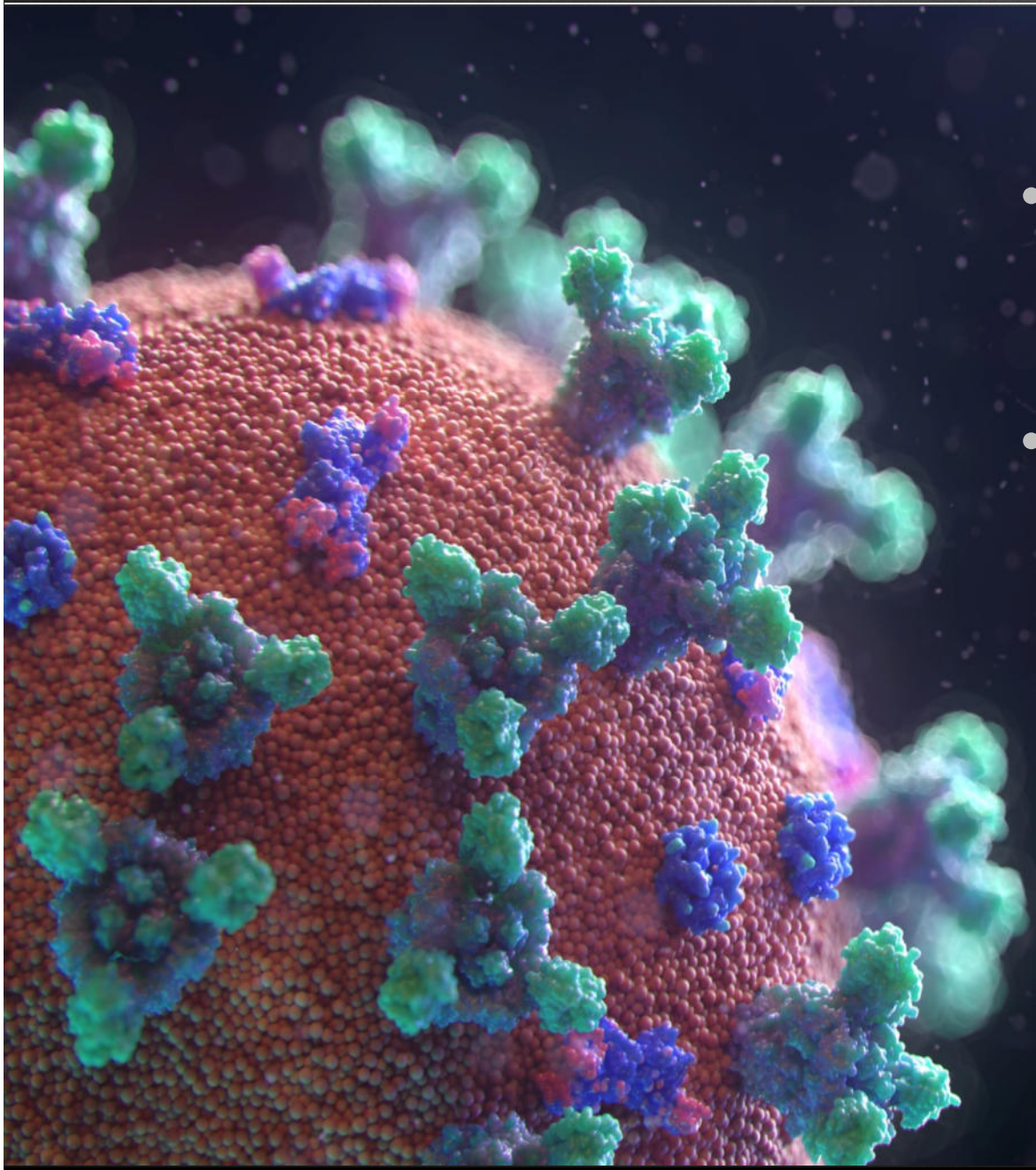
COVID-19 in the world



- High impacts in Economy, HealthCare and humanitarian aspects
- Actions
  - Stablish public policies for rapid response
  - Create crisis committees
  - Monitor the dissemination and impacts

Latin America scenarios

Using Data Science to face COVID-19

- Mobility monitoring
  - Argentine, Chile, Mexico, Peru, Brazil, and others
- Legal issues delimited the level of monitoring
  - Local laws similar to GDPR(Europe)

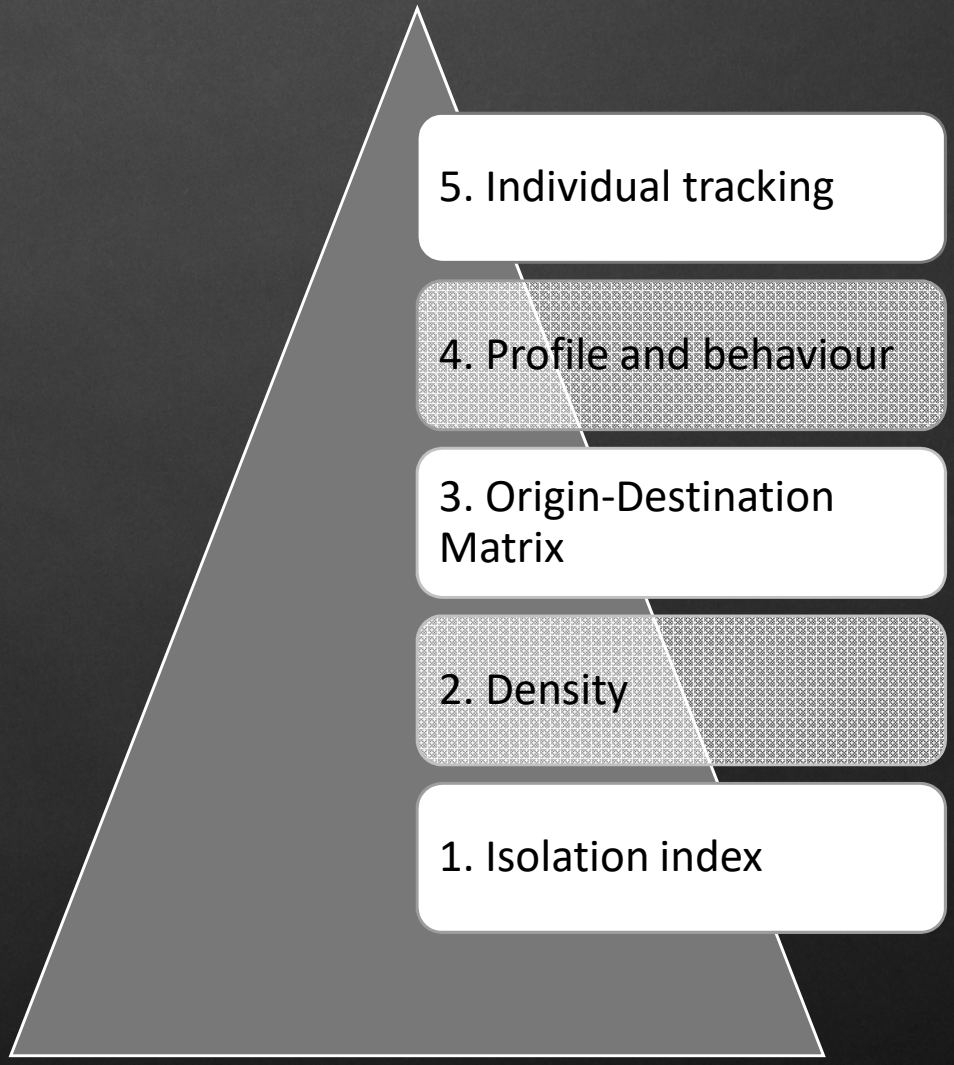
Brazil - São Paulo Case

Situation room

- Biggest state and start point in Brazil
- Information Systems and Intelligent Monitoring
- Using agile methods for fast deployment in 3 perspectives
  - Mobility (isolation and traffic flows)
  - Economy
  - Healthcare

Mobility monitoring approach

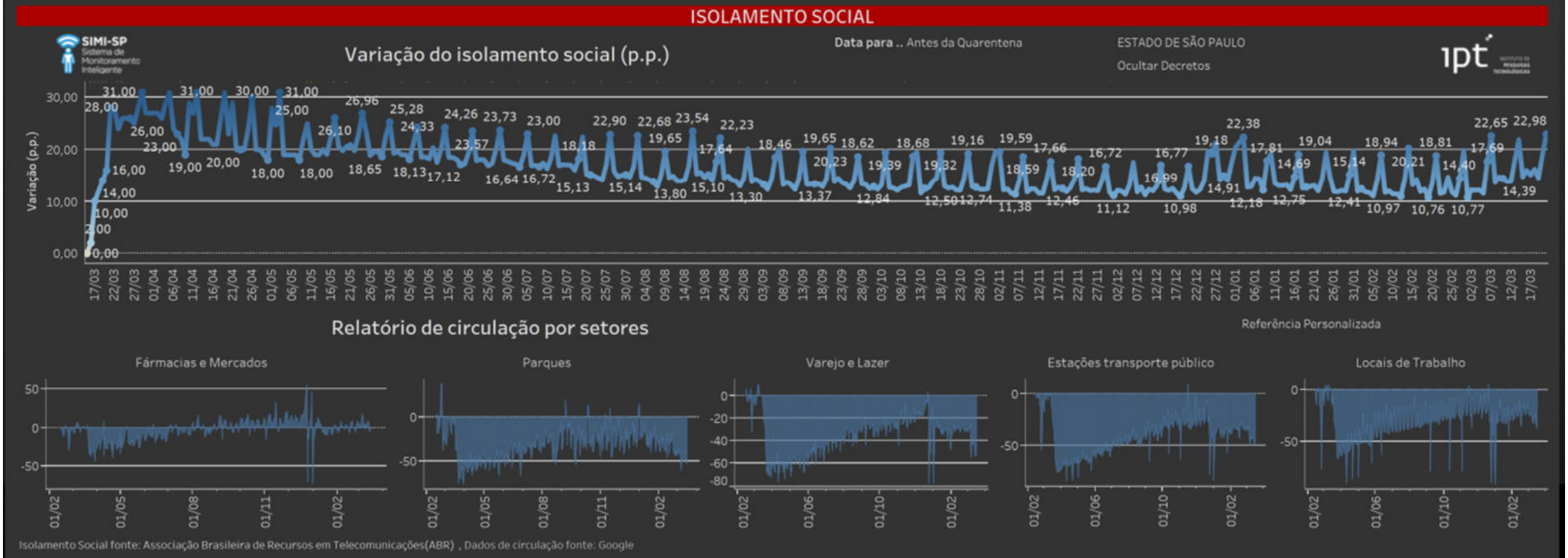
- Adequate to local regulations
- Identify tendency and behaviour
- Stablish triggers to move in escalator level
- Define the mobility restrictions



Escalator approach for mobility monitoring

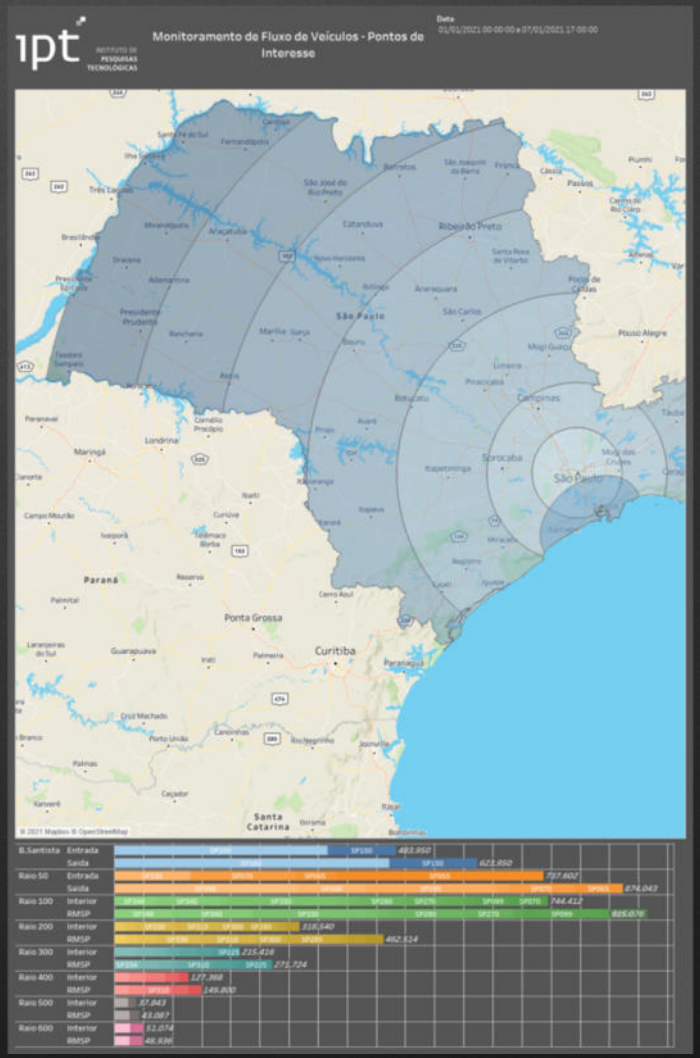
Mobility - Isolation index

- Using big data from telecommunications infrastructure
- Anonymized data from cell towers
- Useful:
  - To check if restrictions polices were effective.
  - Virus dissemination analysis and correlation of mobility



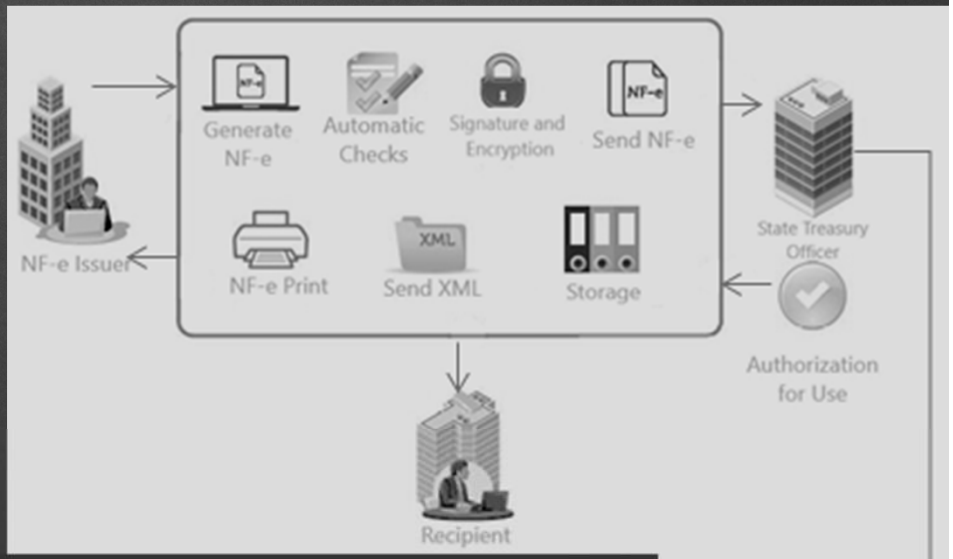
Mobility – Traffic flows

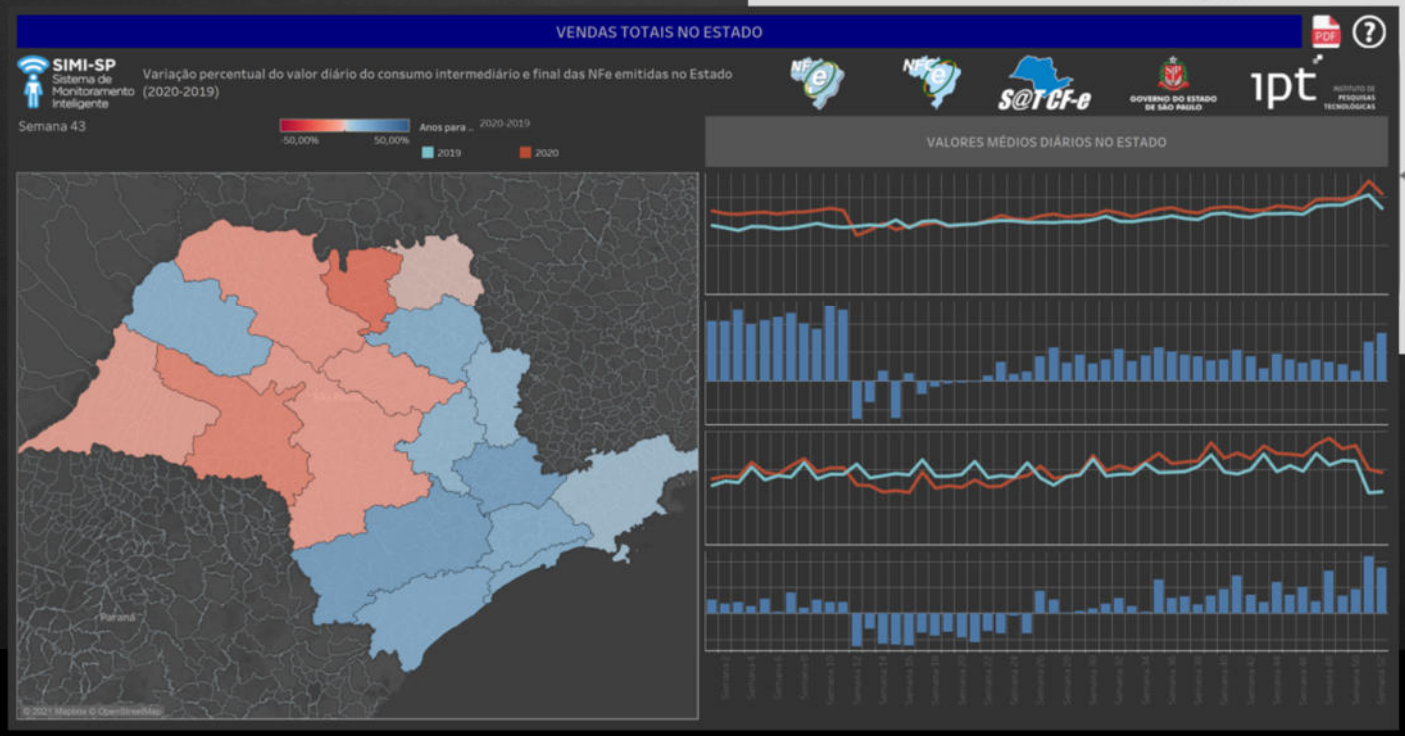
- Using IoT device inside road infrastructure
- Vehicle counters (volume) and RFID tags for Origin-Destination mapping
- Useful for analysis in:
  - virus spreading from capital (epicenter) to country
  - economic impacts based in mobility pattern



Economy

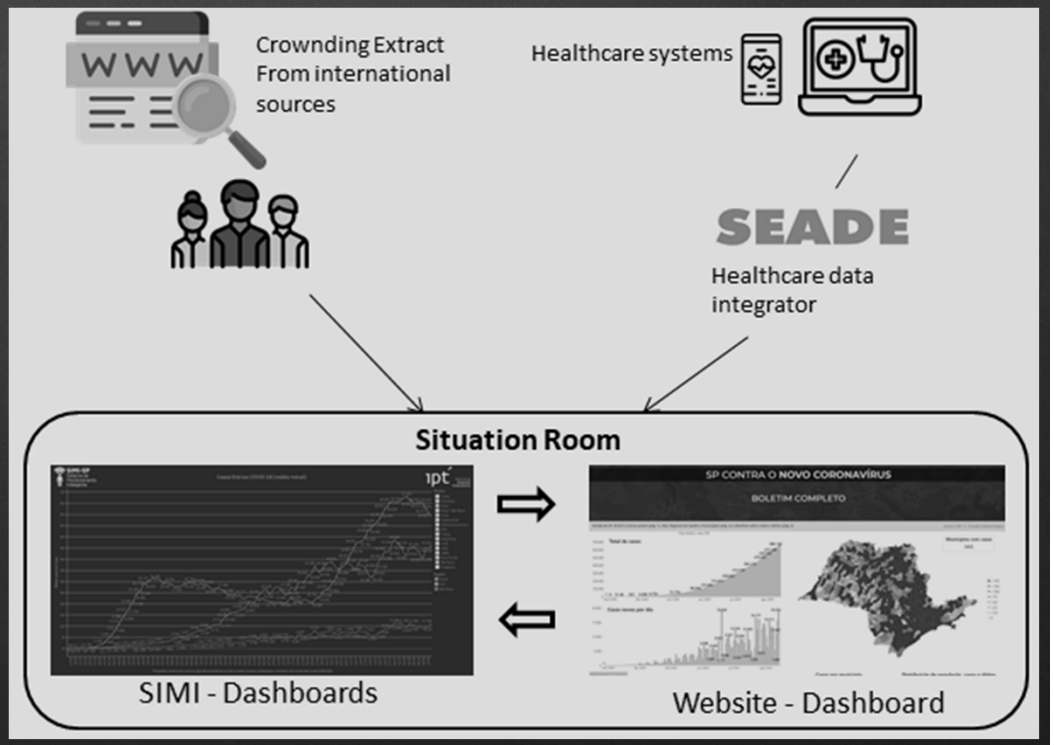
- Using electronic ticket in treasury office
- Anonymized and segmented by sectors
- Useful for analysis in:
  - Restrictions X economy activity
  - Identify sector more impacted and action for subsistence





HealthCare

- Number cases an deaths
- Hospital capacity
- Correlation with mobility scenarios



Conclusions

- Data science became more clear the situations and views from pandemic scenario
- Rapid feedback from actions to face the COVID
- Multidisciplinary teams and data integration were essential to aggregate and subsidize government officials in evidence-based decision-making to face

Escalator level	Modus operandi
Isolation Index and Density	The Cellular Operators offer the index using anonymous connections in Cell site, as well as the density maps. **Big Data scenario**
Origin-Destination Matrix	The Highway Operators offer the anonymous flows and tags from Automatic Vehicle identification to OD-Matrix. **IoT Scenario**
Profile and behaviour	Google offers community mobility reports, which are used by SIMI dashboards to show relative mobility to 4 classes. Besides, the monitoring of electronic invoice promotes an understanding of economic rescue, and in the case of retail could reflects the acquisition of goods and services in these locations. **Business Intelligence scenario**
Individual tracking	São Paulo did not use this feature

Thank you

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Open data: https://www.saopaulo.sp.gov.br/planosp/simi/dados-abertos/