



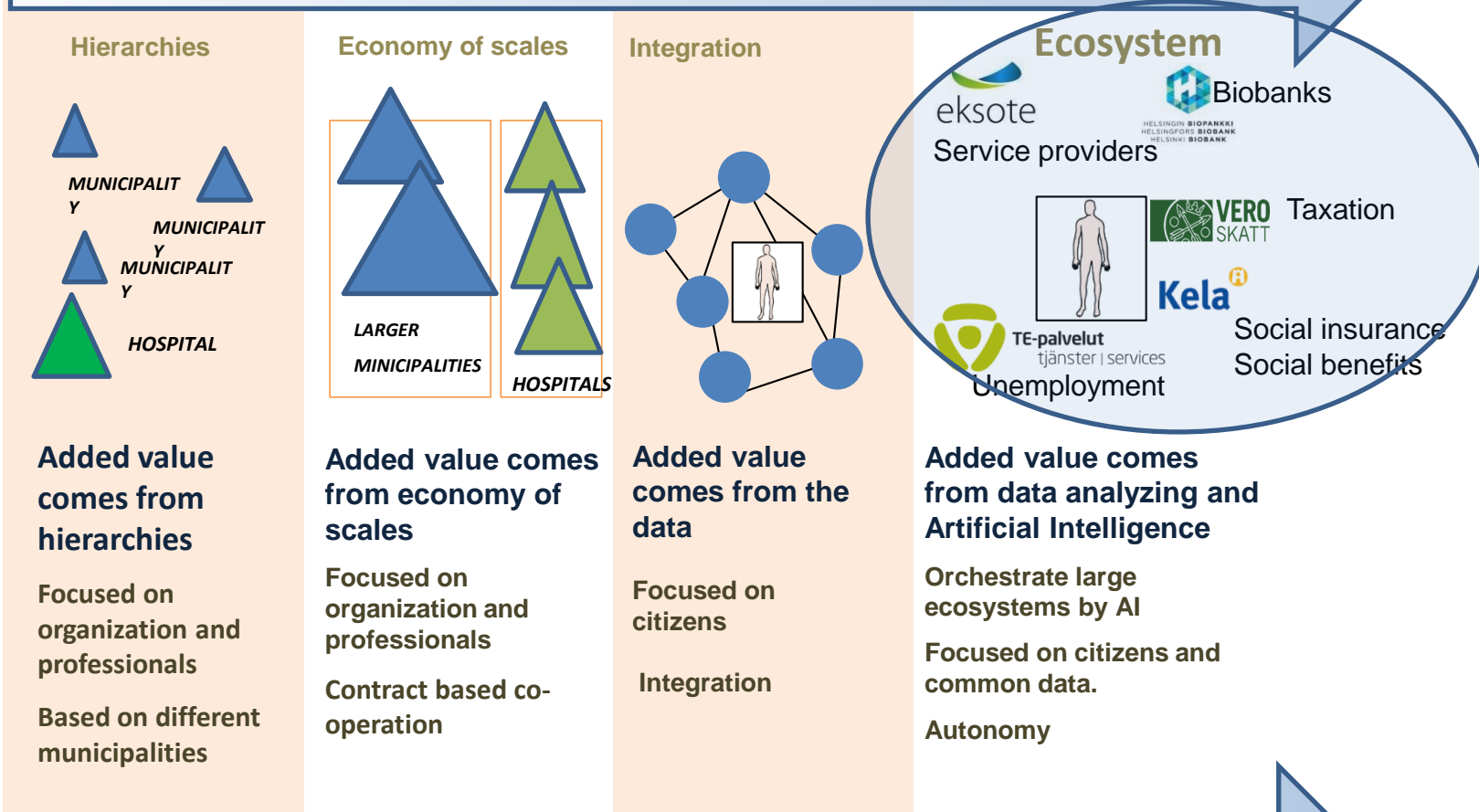
Shifting care resources using predictive analytics and AI: the case of Finland.

Dr. Pentti Itkonen



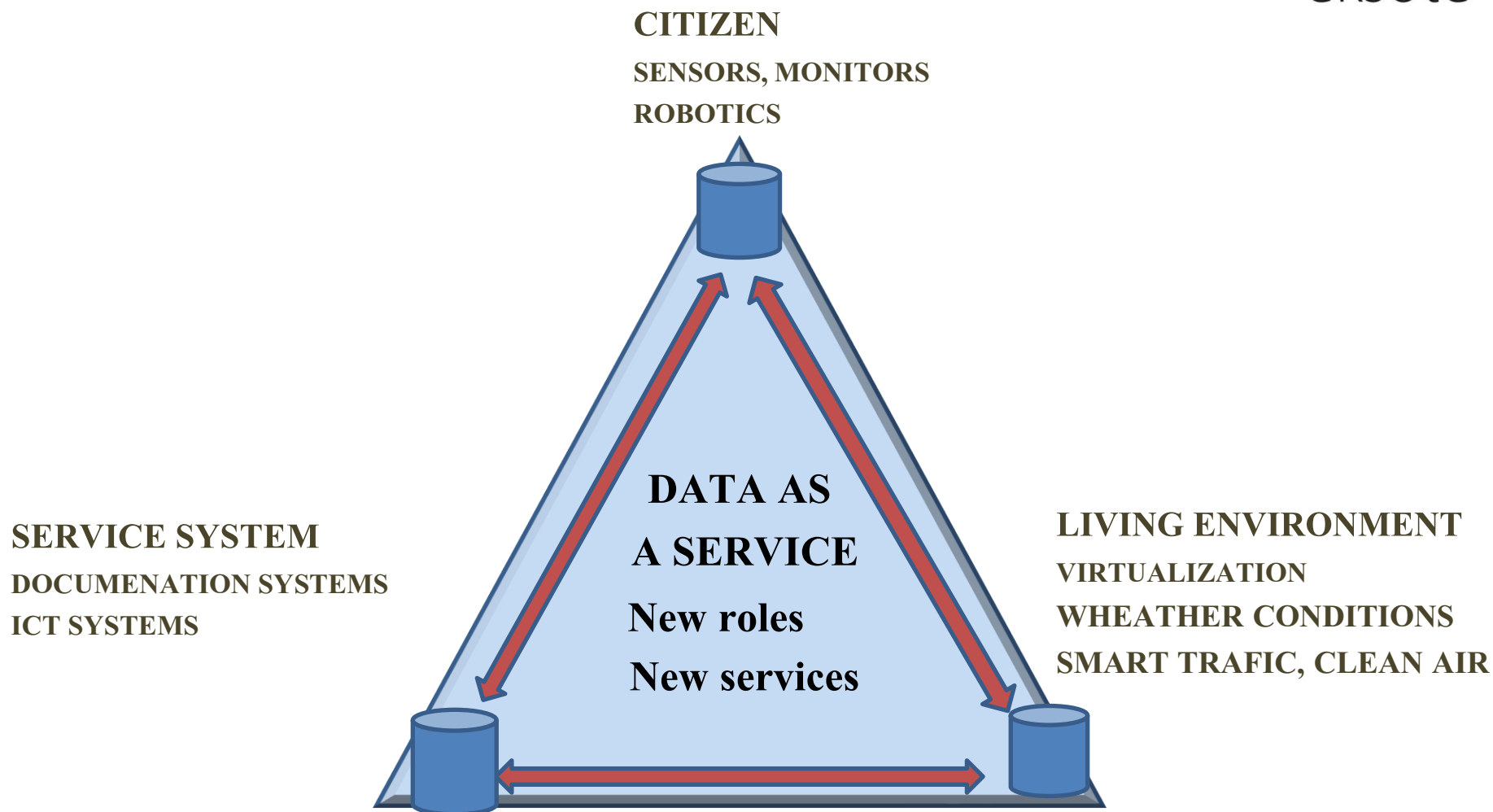
Development of service integration

Added value comes from data

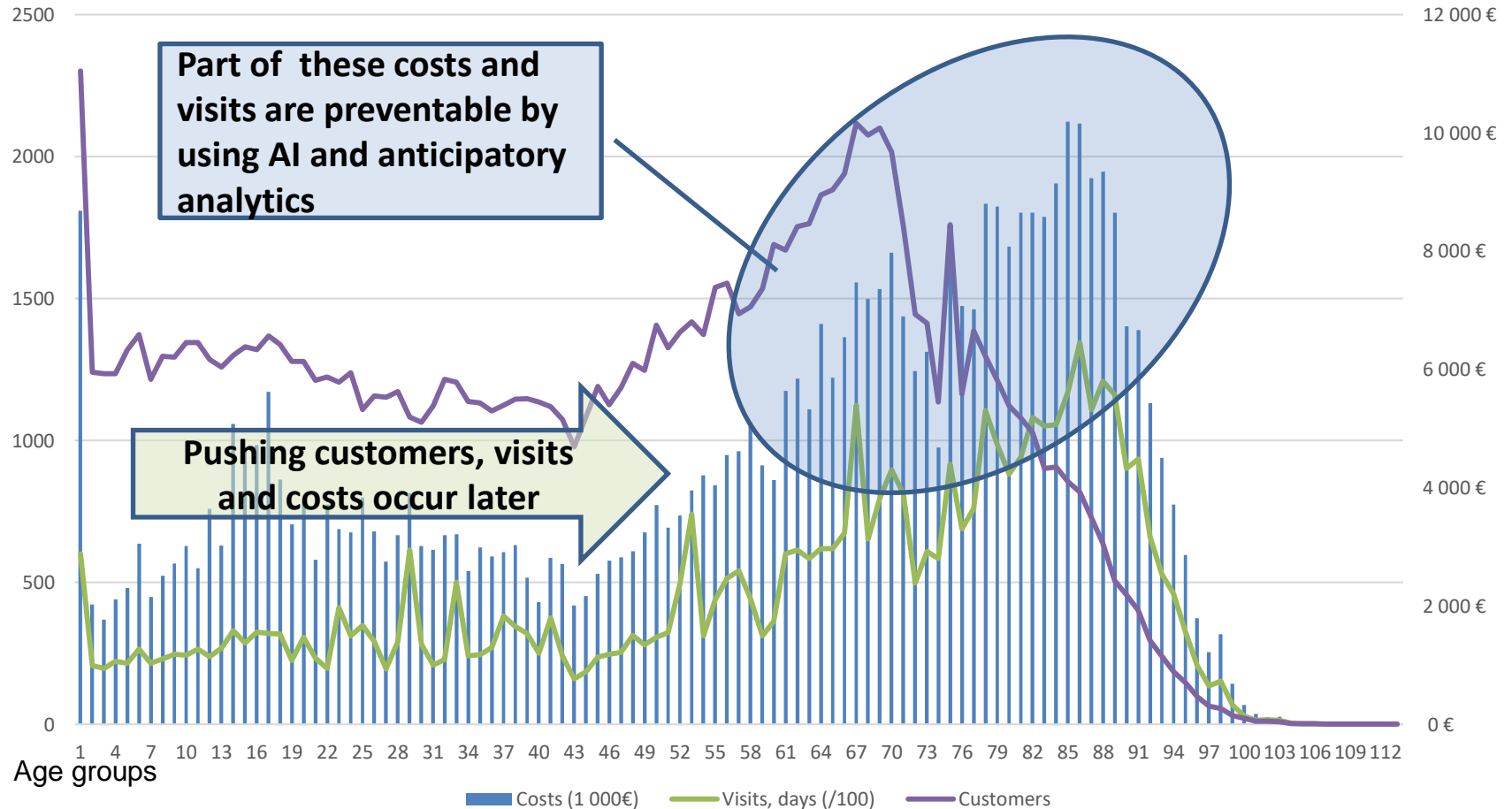


Autonomy of the workers and citizens

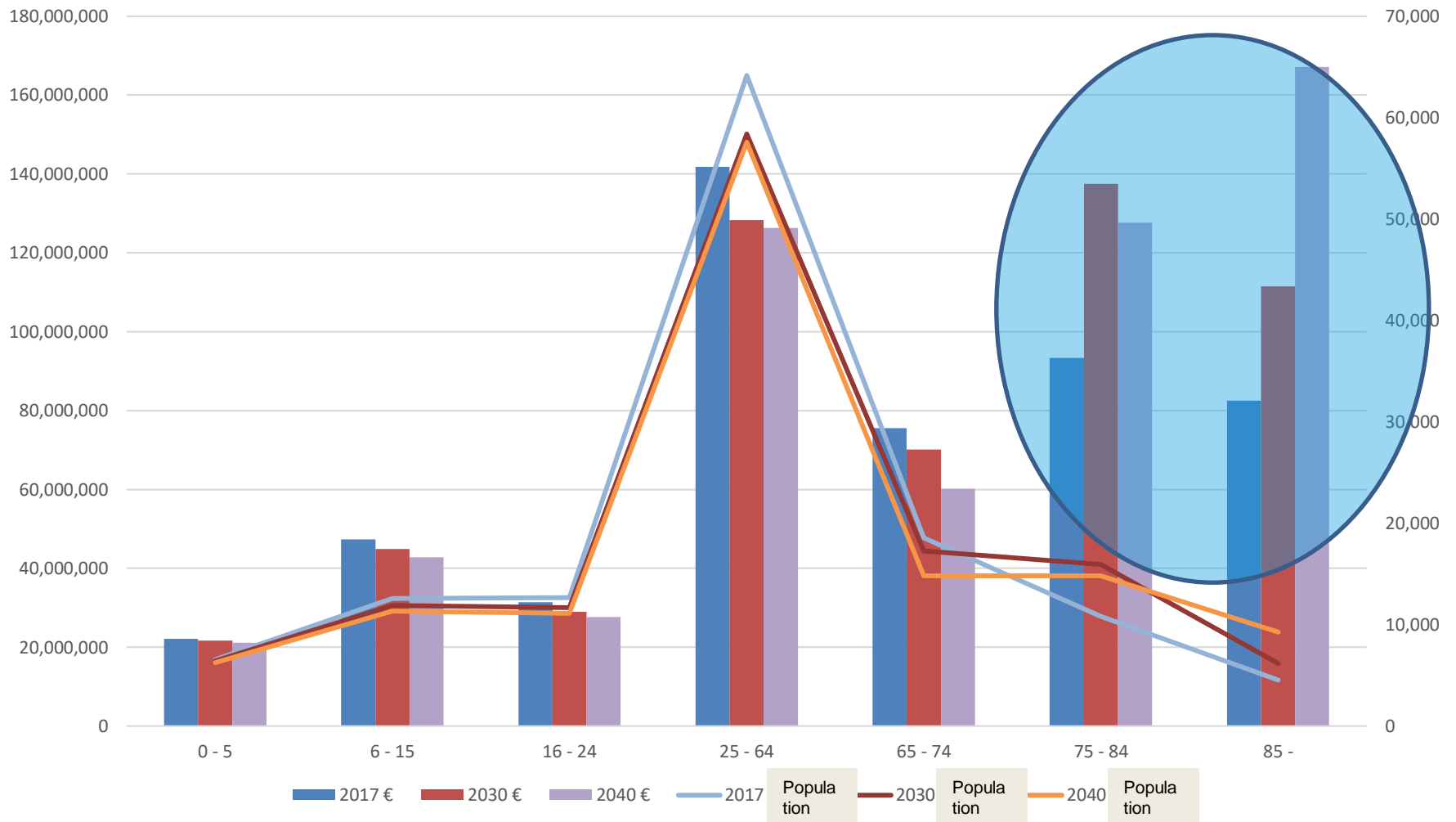
OVERALL VIEW OF TECHNOLOGY INVESTMENTS



Silver Economy-Common challenge in most countries



The development of costs and population change in South Karelia during 2017-2040



Strategic background in using new technology

In spite of long period of development the workers are still bound to the system and pretty far from the autonomy of work where the systems release workers to use independently their education, knowledge and skills.

The technology itself cannot solve the issue but we need to have much more returns of these technology investments.

In the near future social and healthcare systems must provide more values instead of great volumes.

There is a huge need to see the data as a service.

This calls for more understanding of holistic organizations, measurement of social- and health outcomes and wellbeing and more professional performance management.

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Silver Economy-Facts and risks in strategy background



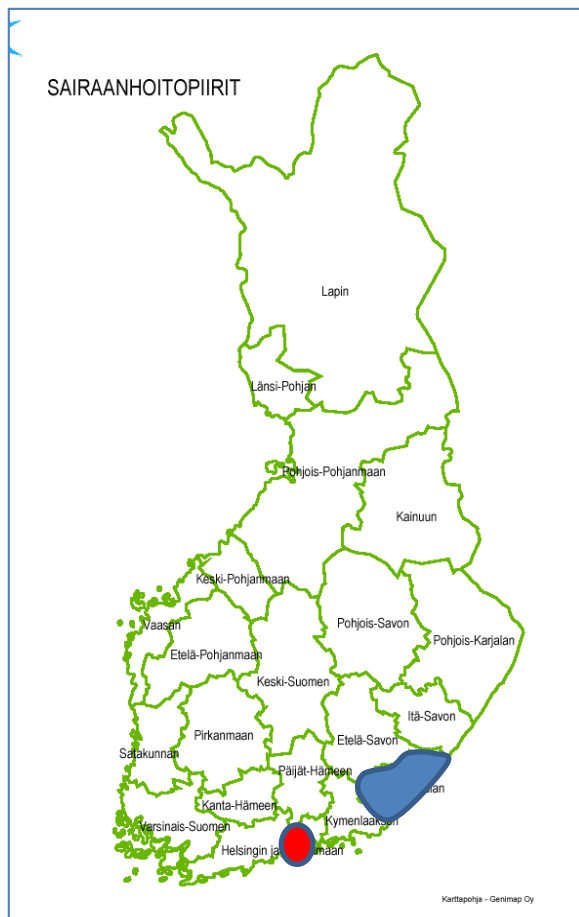
- The growing number of elderly people means financial crises in social and healthcare;
- The decreasing birthrate means the lack of workforce in long term;
 - The competition of workforce will tighten and all organizations need to regard the wellbeing of their staff also of the elderly workers and their longer staying in work life
 - We cannot solve these crises only by adding human resources.

The South Karelia Social and Healthcare District



Integrated and responsible for the whole Social and Health Care in the South Karelia Region.

The role is to coordinate and provide. Municipalities are responsible of the financing.



Population 130.000

Budget 520 M€

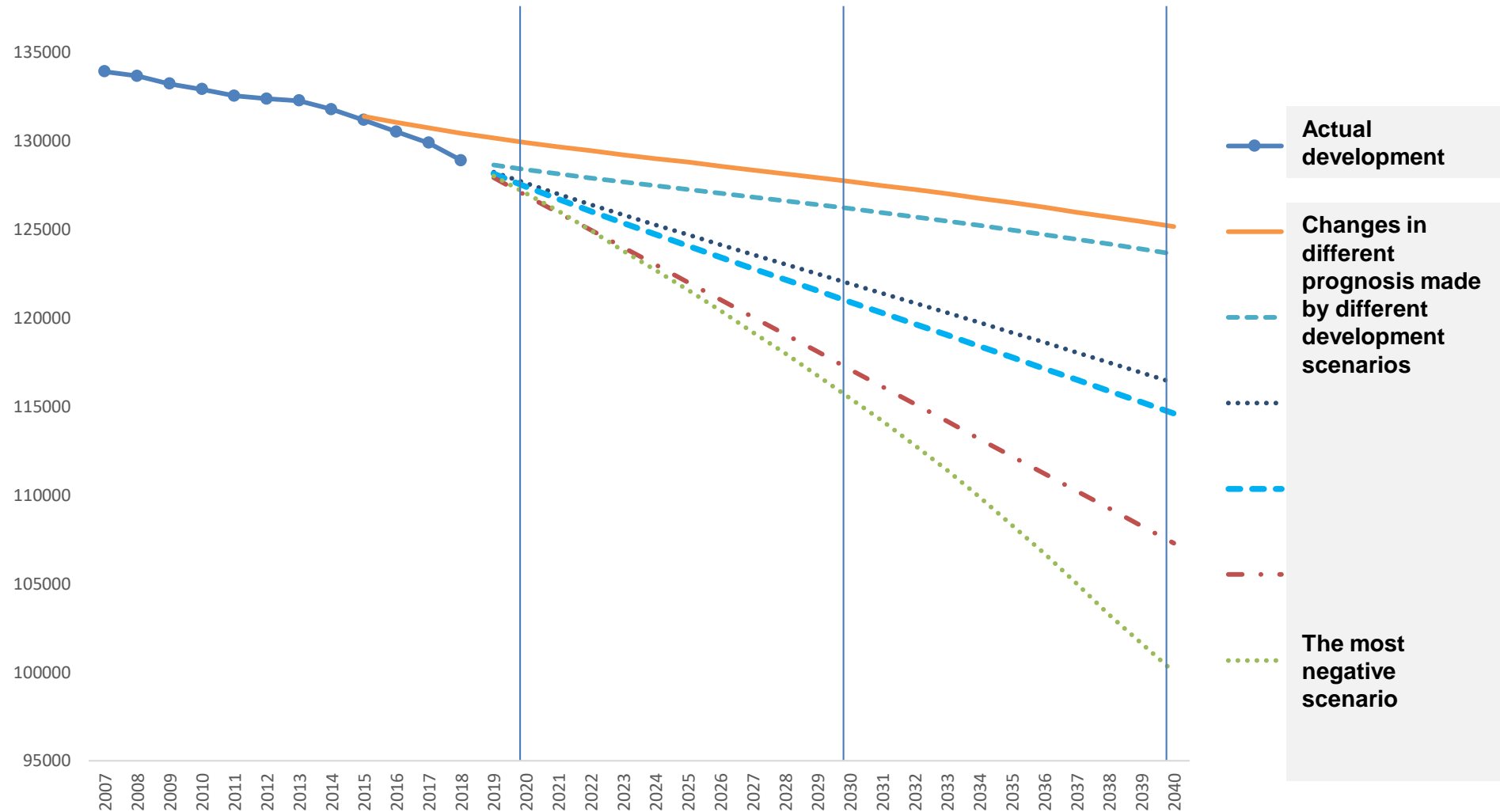
Workers 5600

One acute hospital

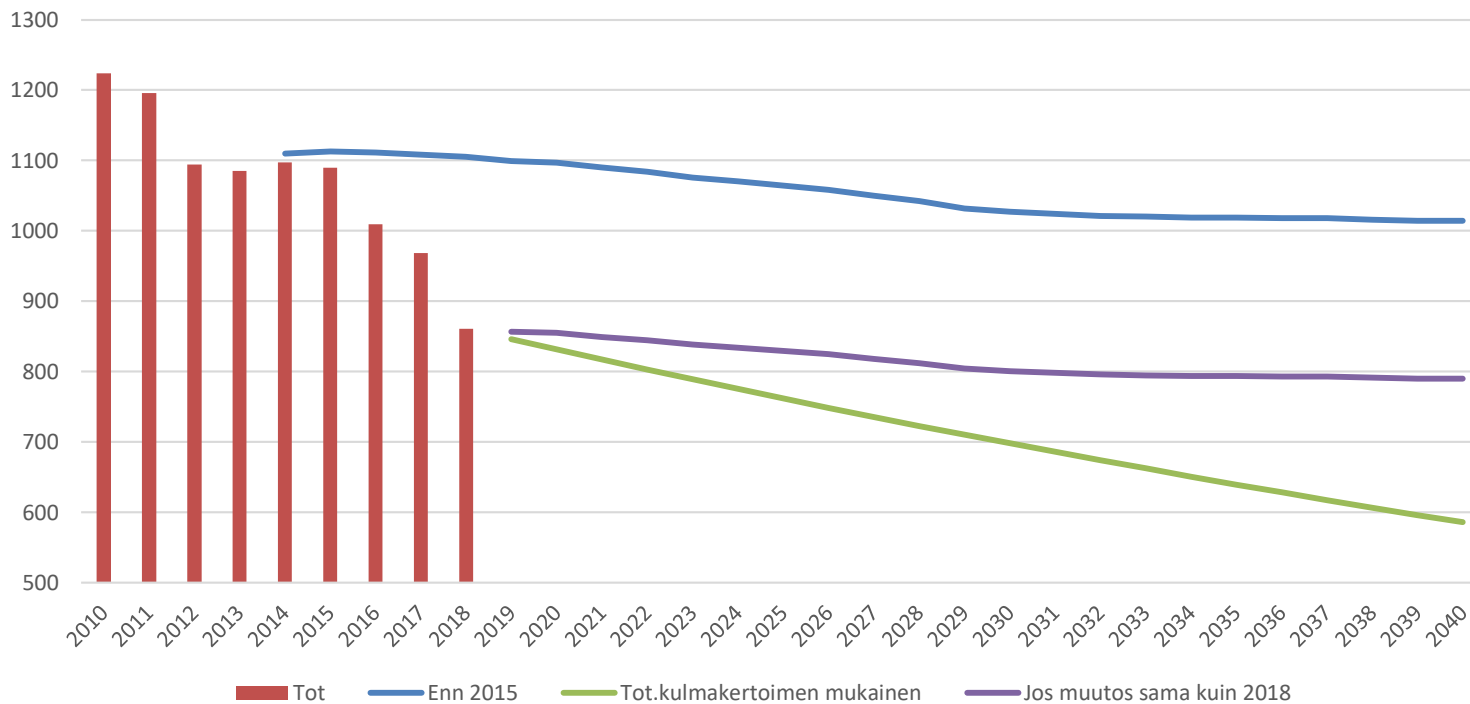
Nine welfare centres in municipalities



The number of population in different scenarios in South Karelia



The actual deliveries and estimated deliveries in South Karelia (=Finland)



The birth rate has decreased 30% during 2010-2018.
In all three different estimations the number of deliveries is decreasing from 22% up to 42%.

In the beginning



Why the new regional and integrated model Eksote was made

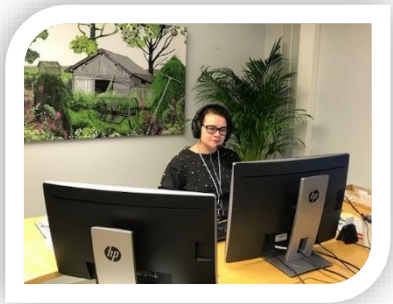


- Traditional arguments :
 - Integration between the acute hospital, primary care and social well-being services means a new and better balance between primary care, social services, services for elderly people and hospital;
 - Better coordination in strategy, financing, ICT and investments
 - Common use and recruit of staff.
 - Share the resources in a new way
- Arguments that we have learned:
 - Future challenges and the strategic edge is the population development and as a result to support home care;
 - Added value comes from data; Data as a service;
 - Artificial Intelligence, robotics, machine learning;
 - Only those patients go to the hospital who really benefit the hospital care. The largest cost savings resulting the fact that hospitals will have fewer patients.

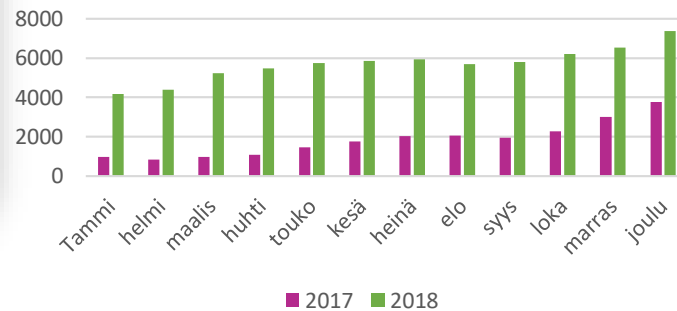
Artificial intelligence in home care in South Karelia



Homecare virtual visits



Development of the visits



Implemented remote visits 2018

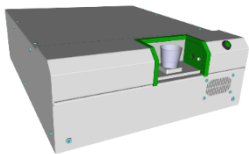
68 400 kpl

Pilot customers 250



**Savings 500€
/month/customer**

Medicine robot



**60 testing
customers**



**Savings
400€/month/customer**

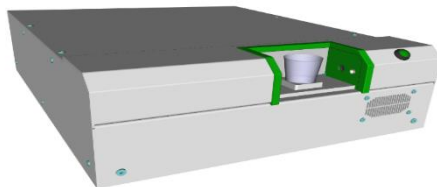
Data as a service



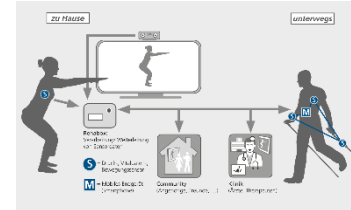
Virtual visits



Intelligent insulin pumping



Robot medication



Tele rehabilitation



List of addresses. The nurse can plan the working day autonomously



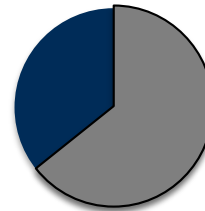
AI USED IN DATA ANALYZING

2 new service models

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2014 Homerehabilitation

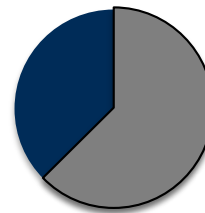
2016 ER in your livingroom



30% COST REDUCTION



56% LESS REGULAR HOME CARE CUSTOMERS



33% COST REDUCTION



88 % NO NEED FOR HOSPITAL CARE

Data as a new reporting system

- How the different age groups use services
- After using new services, do they come back to use some other services?
- Are the patients and customers still at home after certain period of time?
- What is the service utilization and costs of different customer groups and are there any changes?
- How the customer groups care/service pathways have gone (processes)?
- Aid in decision making: What are the options and what are the effects (to customer and costs) on longer term?



Lessons learnt

Deeper integration

- Hospitals will have a vital role in the care also of the elderly.
- In the future they are seen more as one part of the system.
 - Acute care and emergency services with primary care, nursing homes, polyclinics, patient's own home.
- All professionals need to rethink where they perform their role to minimize the pressure to hospitals and maximize the effective use of alternative facilities which run at lower costs and exploit the whole potential of technology.

Risks

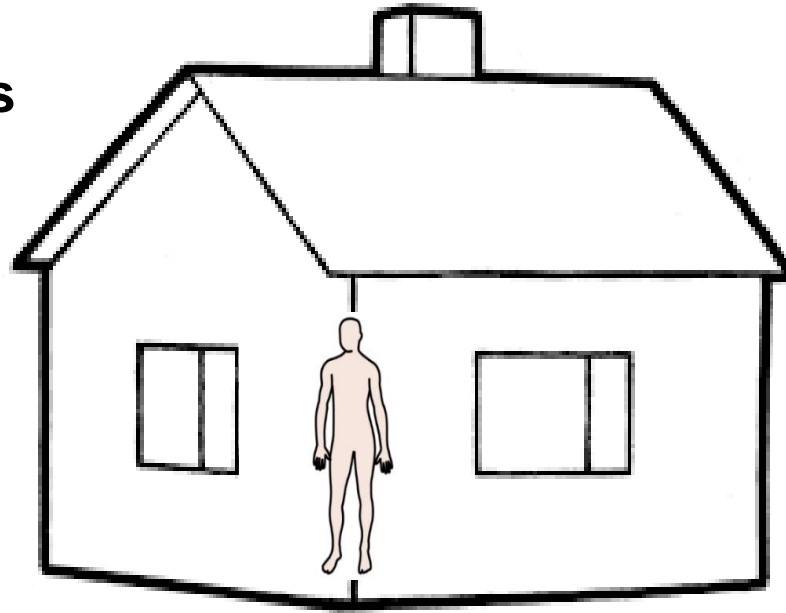
- At the moment social and healthcare is using new technology to automate inefficient structures.
 - Not using the opportunity to design new working patterns
- Machines will take over tasks, not entire jobs.
- The algorithms are so complex that the user may not be able to understand how the machine came to a certain decision.
 - Who is responsible?

Risk in technology development in homecare



Automatic alarms in the building:

- Fire
- Falling
- Exit from bed
- Floor
- Water leak
- Stove
- Fridge
- Heating



Sensors in your body:

- Brain
- Lungs
- Heart
- Circulatory
- Nerve
- Pain
- Medication

Physical visits based on human sense and expertise

Hospitals have taken the ancient role of the castles. They are the centers of their own region. The lord of the castle is planning expansion and new parts of the castle. But what happened to castles when the humble subjects became more independent and autonomous? So many empty castles. Is the fate and the future of hospitals similar to castles?



<https://youtu.be/w4aasiZLY9Q>