Predictive Analytics in Nordic Healthcare

Using AI and Digital Tools

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Athens

Nordic Healthcare Group

Objectives and bio

- Use of advanced analytics in Nordic healthcare
- Opportunities for other industries

Raine Vasanoja
CEO NHG Sweden (Stockholm), Nordic Healthcare Group ApS (Copenhagen)

Background in Manufacturing (Power Electronics) and ICT

- Performance Management and Costing
- Management Consulting – Internationalisation
- Regional Development – infra and education
- Foreign Direct Investment – Energy sector

NHG in brief

Nordic Healthcare Group

EST.
2004

A leading social and healthcare advisory and solutions company in the Nordics, established in 2004

110

App. 110 professionals with a mix of in-depth industry expertise, robust consulting methodologies and analytical skills

1500

Over 1500 projects for public and private sector clients – also for industry outsiders looking for market entry

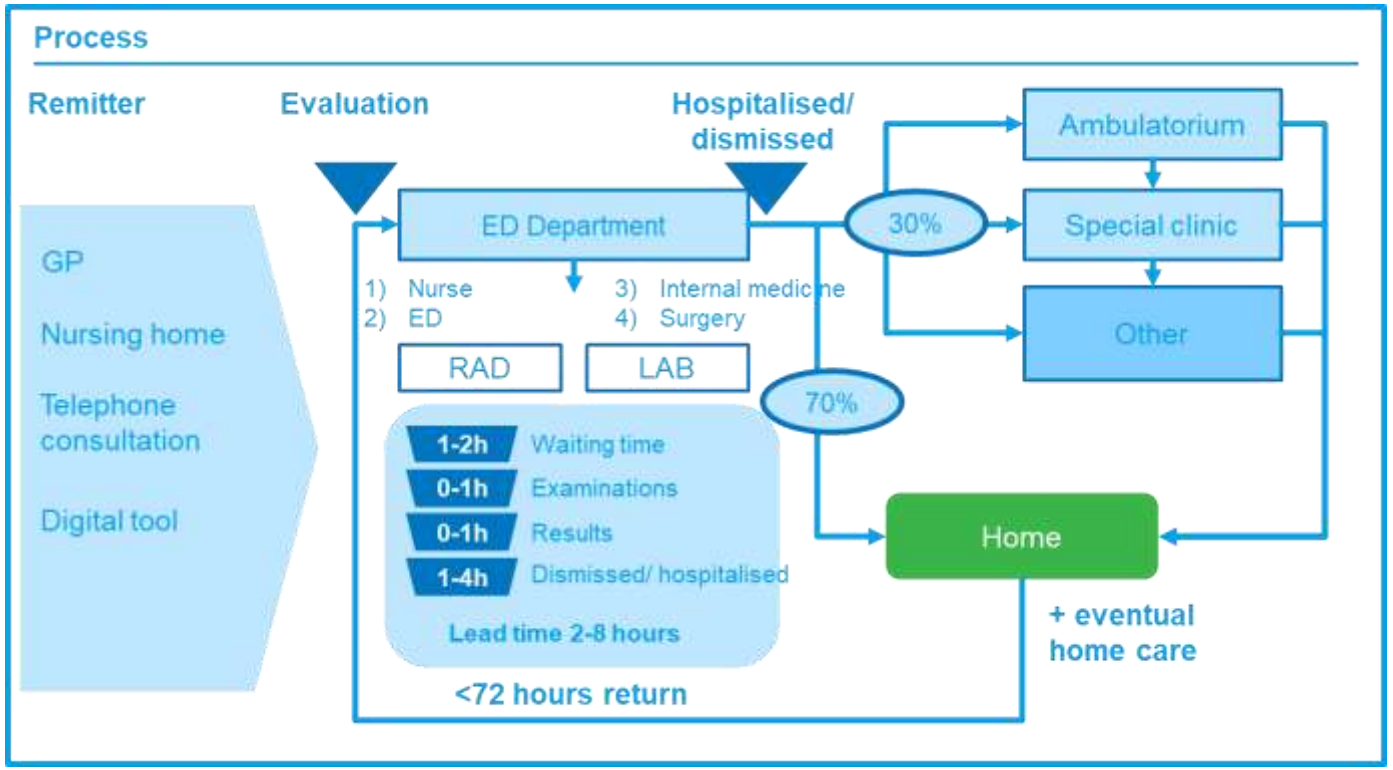
20

More than 20 transactions supported, advisor in all major Finnish social and healthcare transactions in recent years

Nordic Healthcare Group

PREDICTIVE ANALYTICS IN EMERGENCY CARE

Applications for emergency care



Benchmarking

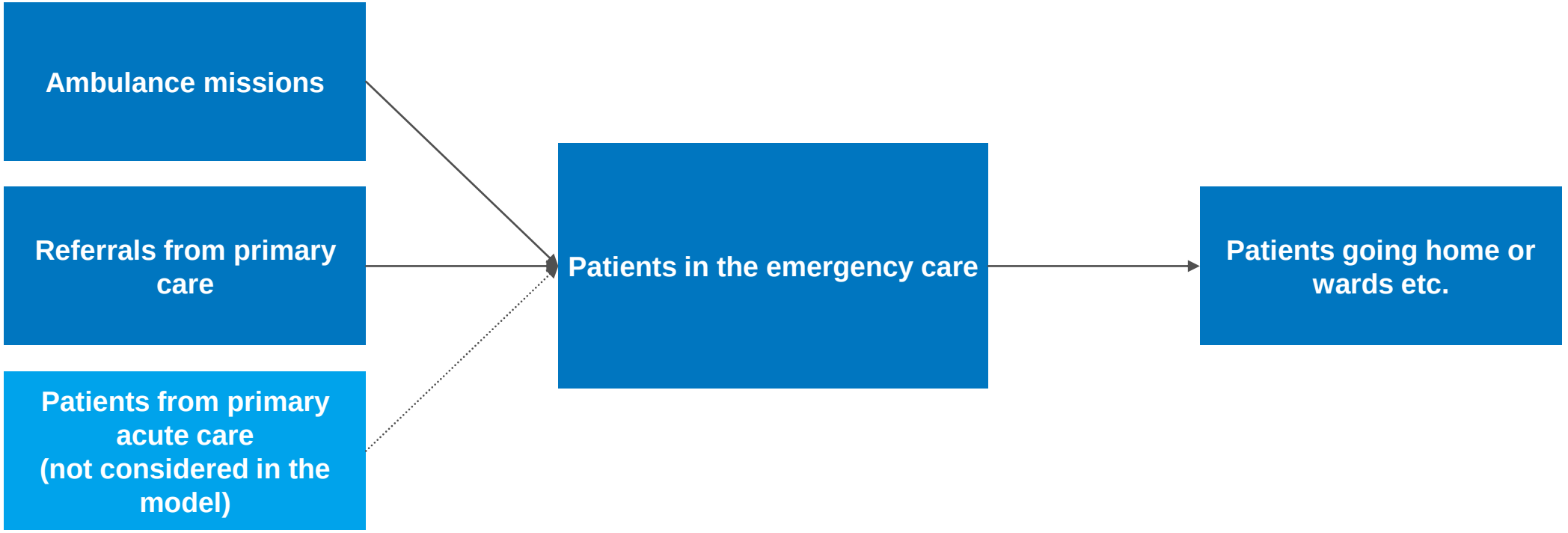
Prediction: # of incoming patients

Tool for optimizing the shifts and length of stay

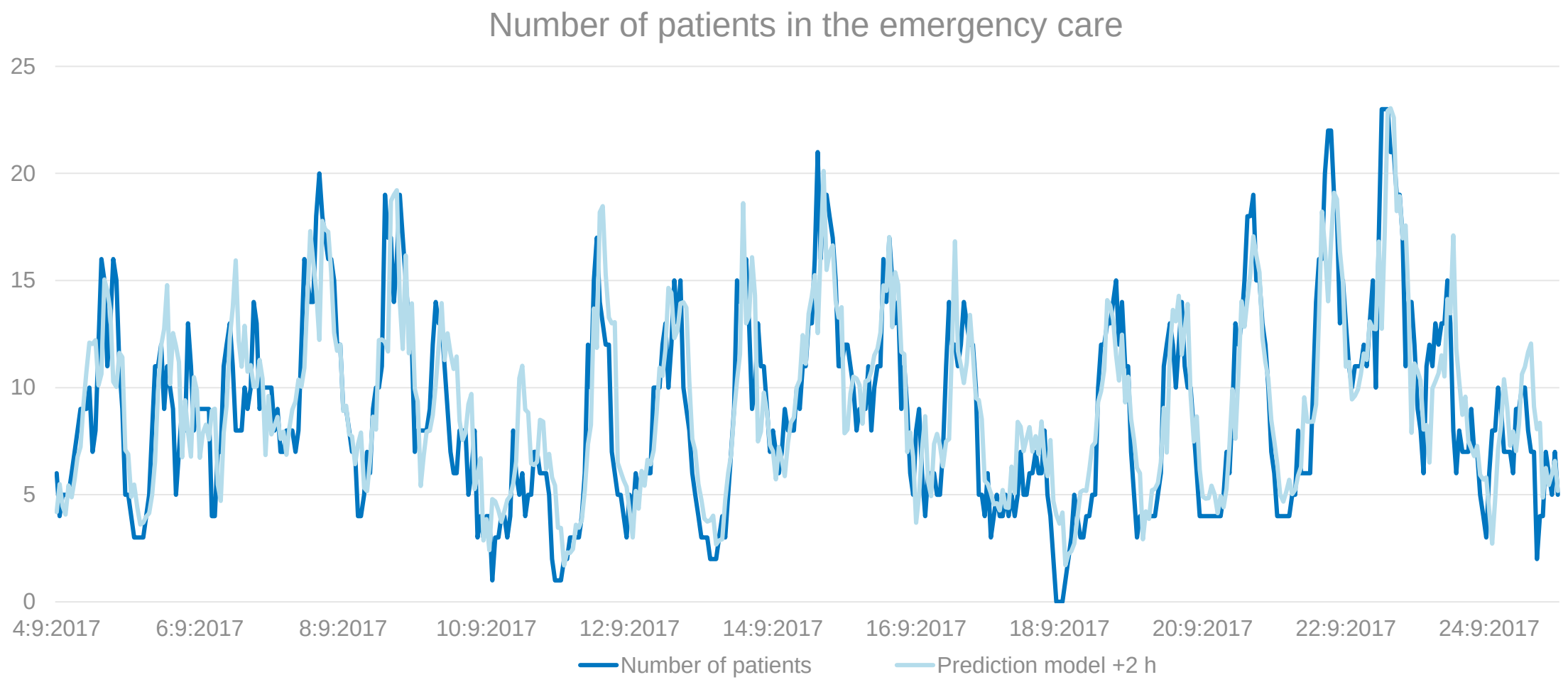
Prediction: risk for hospitalisation

Benchmarking is step 1: operational metrics

of patients in emergency care using the information on referrals and ambulance missions



Machine learning to predict the next hours

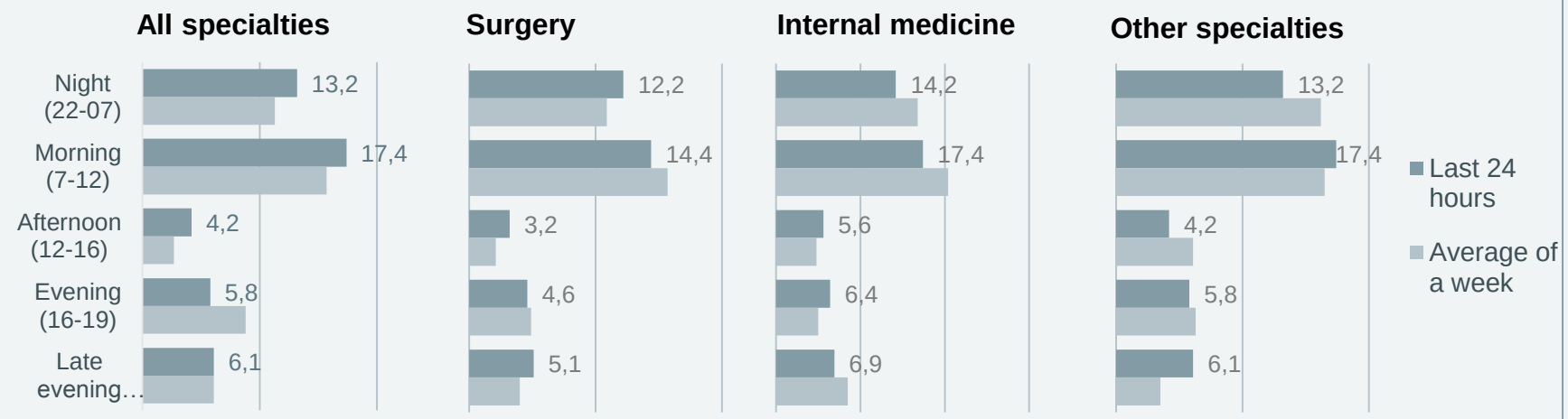


Operational dashboard for emergency care

Updated: 3.4.2019 20:05

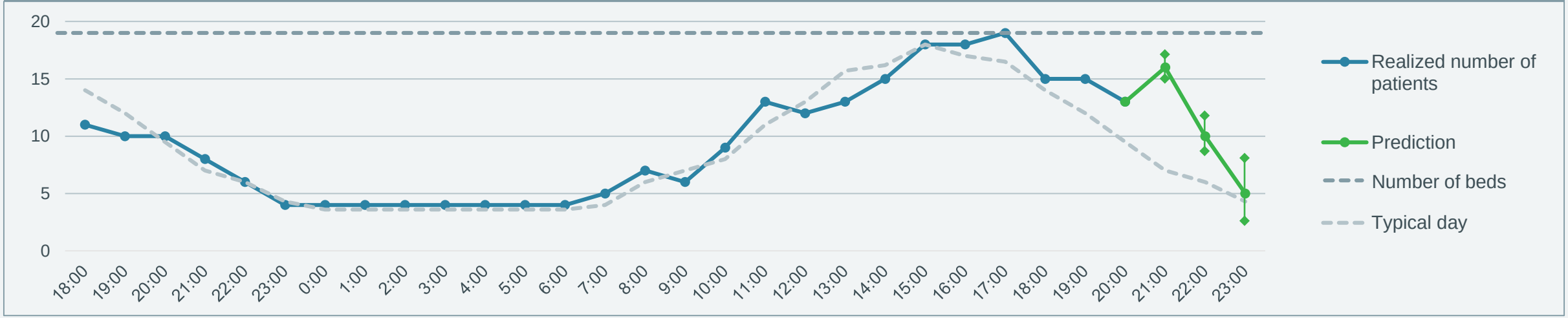
Time	Situation
Now	14 patients 12% more than normally
In 1 hour	16 patients 34% more than normally
In 2 hours	10 patients 31% more than normally
In 3 hours	5 patients 2% more than normally

Length of stay



Number of patients: last day and the prediction for the next 3 hours

Patient group: All specialties Number of beds 19



The length of stay for different visit types

Helps to identify the bottlenecks of the service production

Optimal shifts for the staff for each day and hour

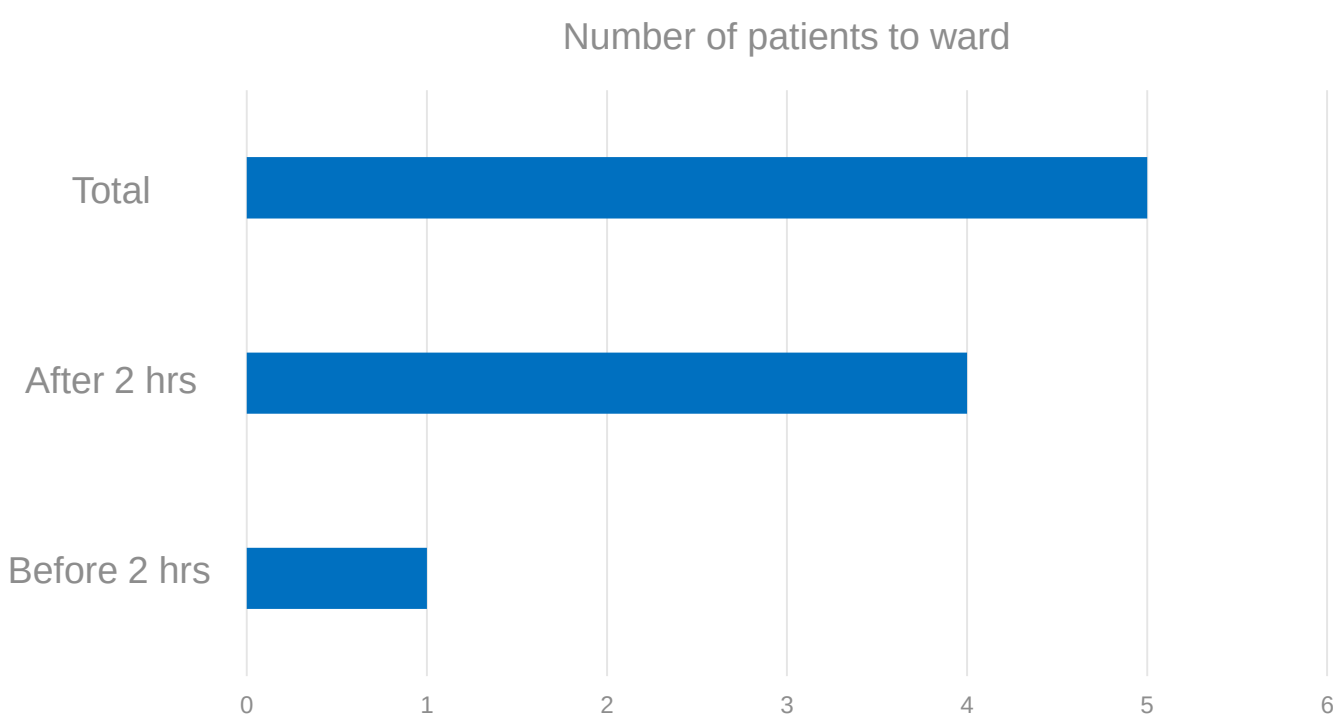
Recommendation of optimal doctor shifts

	Maanantai	Tiistai	Keskiviikko	Torstai	Perjantai	Lauantai	Sunnuntai
0-1	2	2	2	2	3	2	2
1-2	2	2	2	2	3	2	2
2-3	2	2	2	2	3	2	2
3-4	2	2	2	2	2	2	2
4-5	2	2	2	2	2	2	2
5-6	2	2	2	2	2	2	2
6-7	2	2	2	2	2	2	2
7-8	2	2	2	2	2	2	2
8-9	2	2	2	2	2	2	2
9-10	2	2	2	2	3	2	2
10-11	2	2	2	2	3	2	2
11-12	2	2	2	3	3	3	2
12-13	3	3	4	3	3	3	2
13-14	3	3	4	4	5	3	3
14-15	3	3	4	4	4	3	3
15-16	3	3	5	4	4	3	3
16-17	3	3	5	3	4	2	3
17-18	3	3	4	3	4	2	3
18-19	3	3	4	2	3	2	2
19-20	3	2	4	2	3	2	2
20-21	3	2	3	3	3	2	2
21-22	2	2	2	3	2	2	2
22-23	2	2	2	3	2	2	2
23-00	2	2	2	3	2	2	2

- Proposes optimal staffing and reduces waiting times
- Length of shifts accounted for
- Simulates how staffing affects lead times and patient flow
- Identifies bottlenecks in specific stages
- Uses NHG benchmarking data

Wards or diagnostics: time to prepare for incoming patients

The model predicts the LOS and the transfer target for each patient



Probability

After 2 hours			
Gender	**Age**	**Diagnosis**	**Probability**
Female	82	Atrial fibrillation	64
Male	45	Food poisoning	57
Female	67	Hernia	45
Female	76	Fever	23

Possibilities

- Diagnostics; cancer, diabetes, heart
- Home and elderly care – better service plans
- Drug design
- Rehabilitation needs based on metrics
- Autism or Parkinson
- Risk assessment in insurance or banking
- Any digitalised and personified service

Challenges

1. Misperceptions about AI
2. Legislation or ethics
3. Interoperability
4. Lack of valid data
5. Organisational biases

Pro's

1. Better resource utilization
2. Better patient safety and quality
3. Personalised and better services
4. Evidence based decisions

THANK YOU FOR YOUR TIME!

Raine Vasanoja, CEO
Tel. + 46 70 310 57 20
Mail: raine.vasanoja@nhg.se

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