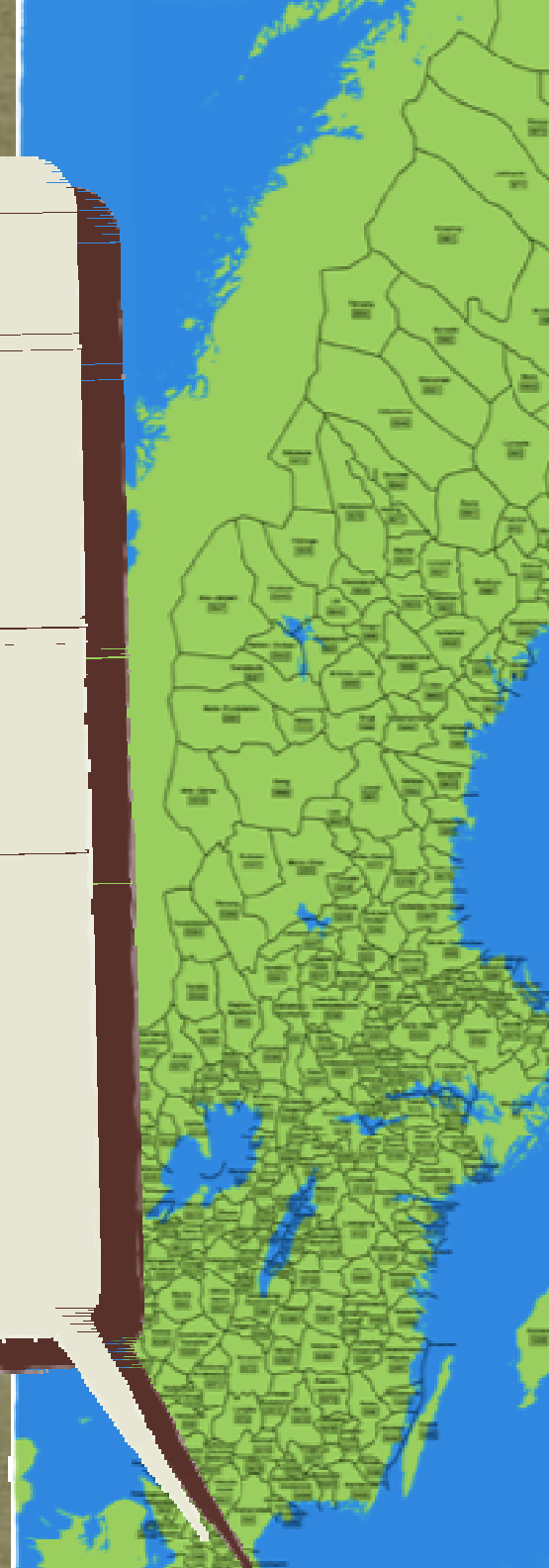


# PACS STATUS IN SWEDEN

Leander, Regional Chief Radiology Officer,  
Skåne Region, SWEDEN



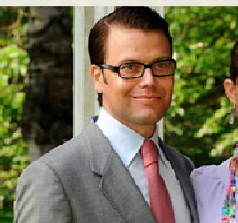
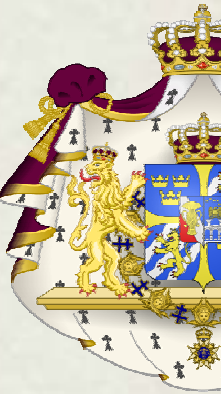
# Sweden

9.4 million inhabitants

450,000 square km

Most people in south parts

Scania 1.2 millions



# The Start in Scania

CS in Ystad 1995 - 1998

CS in Lund 1998

CS in Simrishamn 1999 -

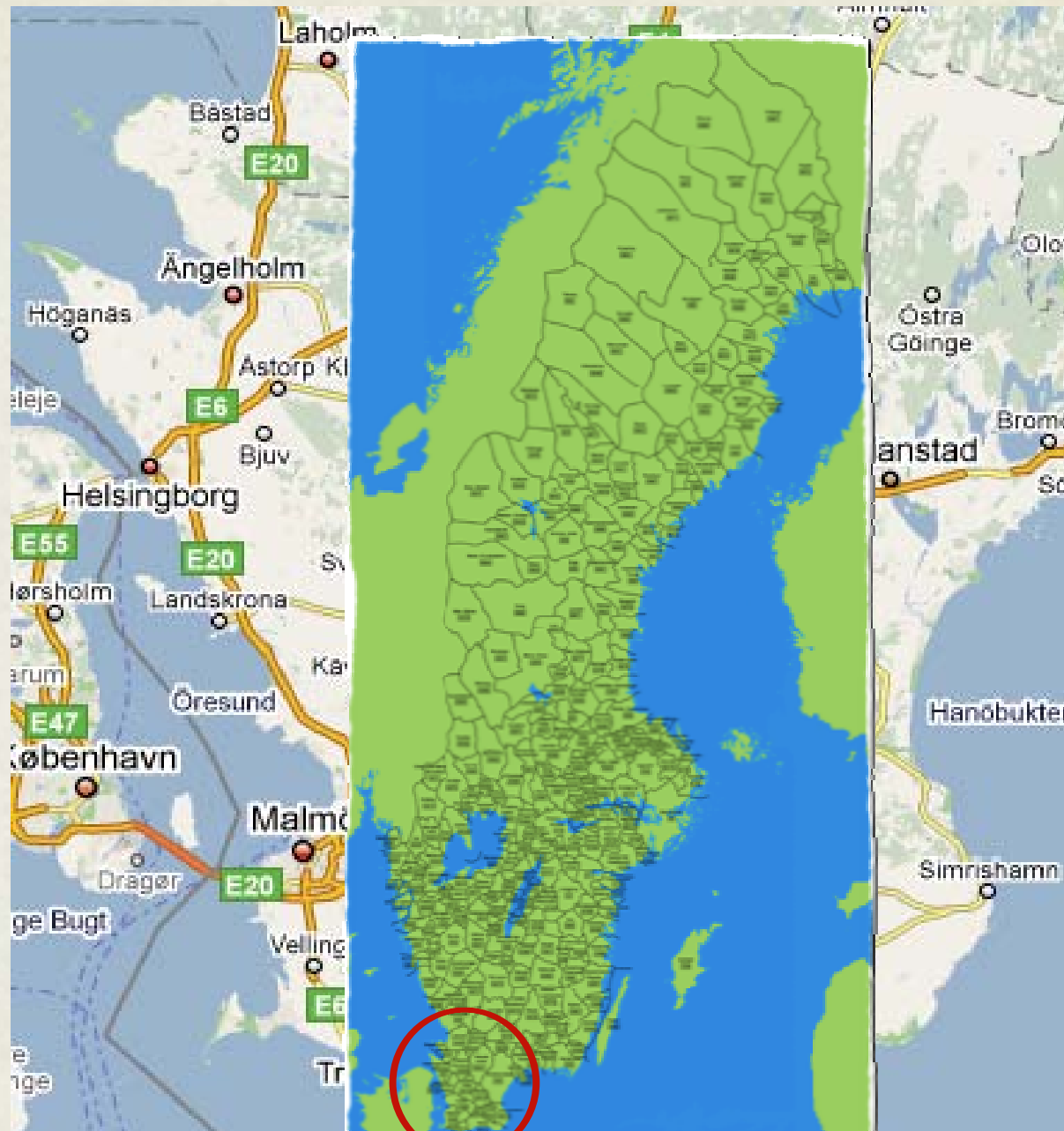
2000

Extra RIS 2000 - 2001

CS in Malmö 2002 - 2004

CS in Kristianstad,  
Assleholm, Helsingborg och  
Ängelholm 2002 – 2003

CS in Trelleborg 2003



We will thank for having the Region's confidence of realising the project of digitalisation of the Radiology in Västerbotten...”

Molger Pettersson and Nils-Gunnar Holmer

Investment 220 million SEK  $\approx$  30 million \$

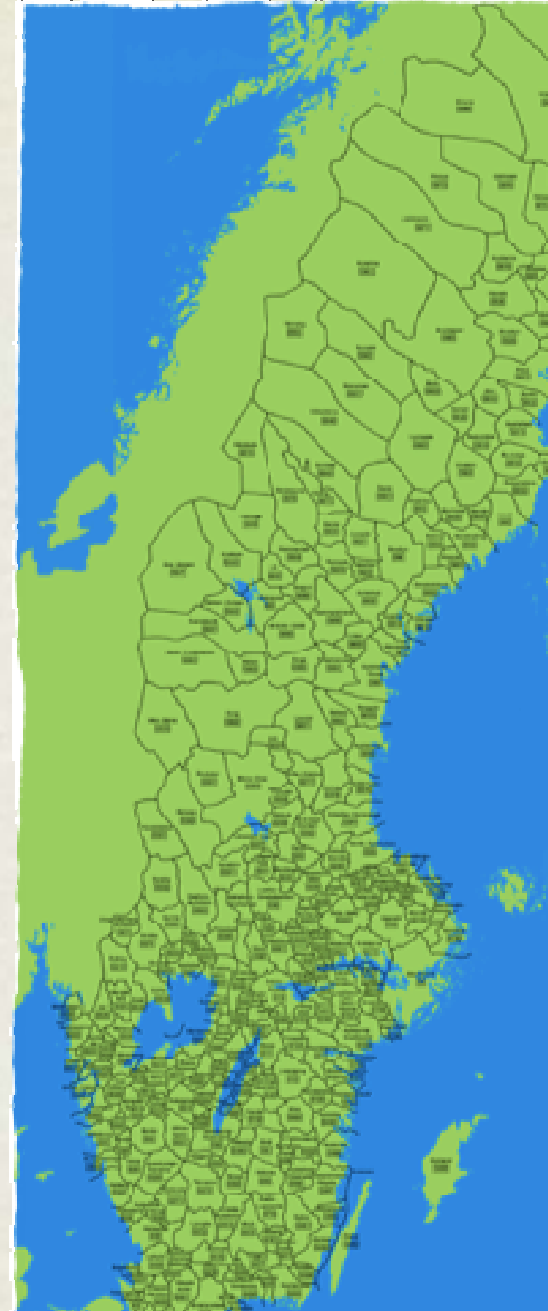
# Country...

PACS were built as individual projects in  
the different county councils

Often first PACS and still using paper  
referrals

hereafter RIS

seldom integration with HIS or clinical  
EMR-systems



# What We Know in Departments

ACS tried to mimic analog  
department but "electronic"  
viewing boxes

later RIS mimicked the  
referral paper-flow



# Communication between Departments

Earlier films were copied and sent between Departments in  
floppy disks

In PACS-era data were copied on CD and sent between  
Departments

Later internet was used and a separate network was set up  
in Sweden called "sjunet"

ACS-data to be sent by PACS Query and Retrieve (Q/R)

ommands manually initiated by telephone or fax  
ommunication – "can You please send me the images of the  
recent CT of personal-id xxxxxx-xxxx Johan Johansson"





# Not a nation-wide PACS!

at that time, 1995-2005

- No national strategy
- No national strategy on HIS/EPR
- PACS were not mature
- Capacity of computers did not cope with large data-load
- Network capacity was not stable and available

still no strategy

still no national strategy

Radiology has come further than clinical systems and driven the development of connecting Regions and counties

# Next Level

numbersome to retrieve and send data by Q/R

Even with DICOM-standard some shortcomings when data is transferred, especially annotations and information in private tags

In addition hard for clinicians to have different web-solutions to work with

A solution is to have a larger hospital-group/Enterprise/Region/County with the same system

Discussion between to hospitals in Scania at RSNA 2005 led to the idea of a common PACS, first for the two hospitals but soon the idea of one single system for the whole region was supported

2009-2011 One SECTRA PACS

Mammography in Scania by private contractor, using the public controlled PACS

sectra RIS with several databases

MEI

produces about 750k exam per year

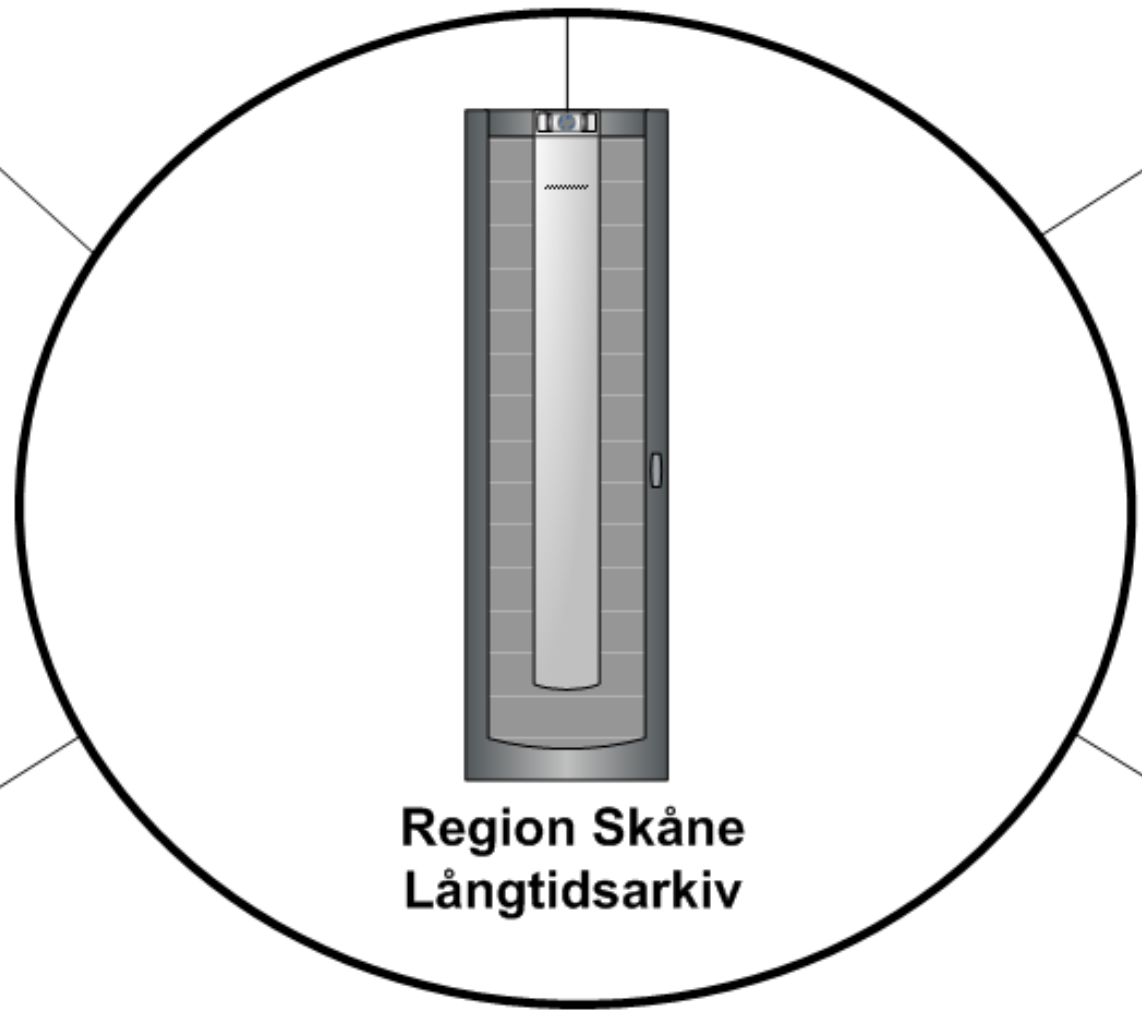
hospitals

00 concurrent users

120 TB (3,5M examinations) to migrate from former PACS

# Sectra PACS Region Skåne

SkåNet



Datacenter  
anstad-Hässleholm-Ystad

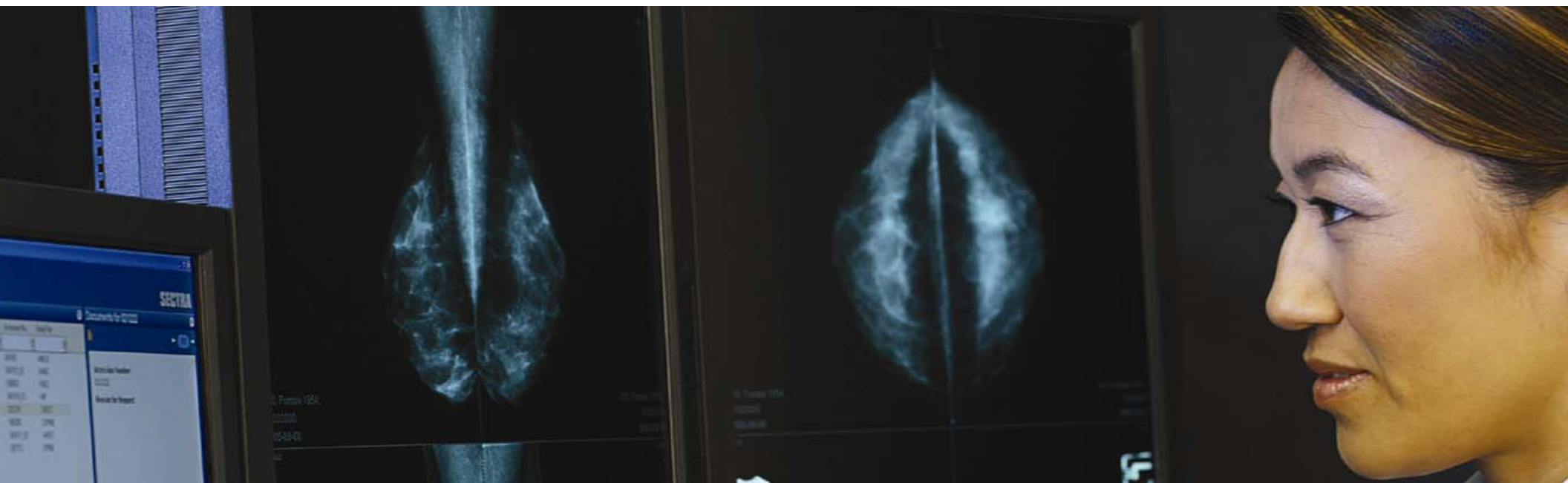
Datacenter  
Malmö-Trellebo  
inkl backuplösni

Datacenter  
Malmö-Trellebo-Ängelholm

Datacenter Lun

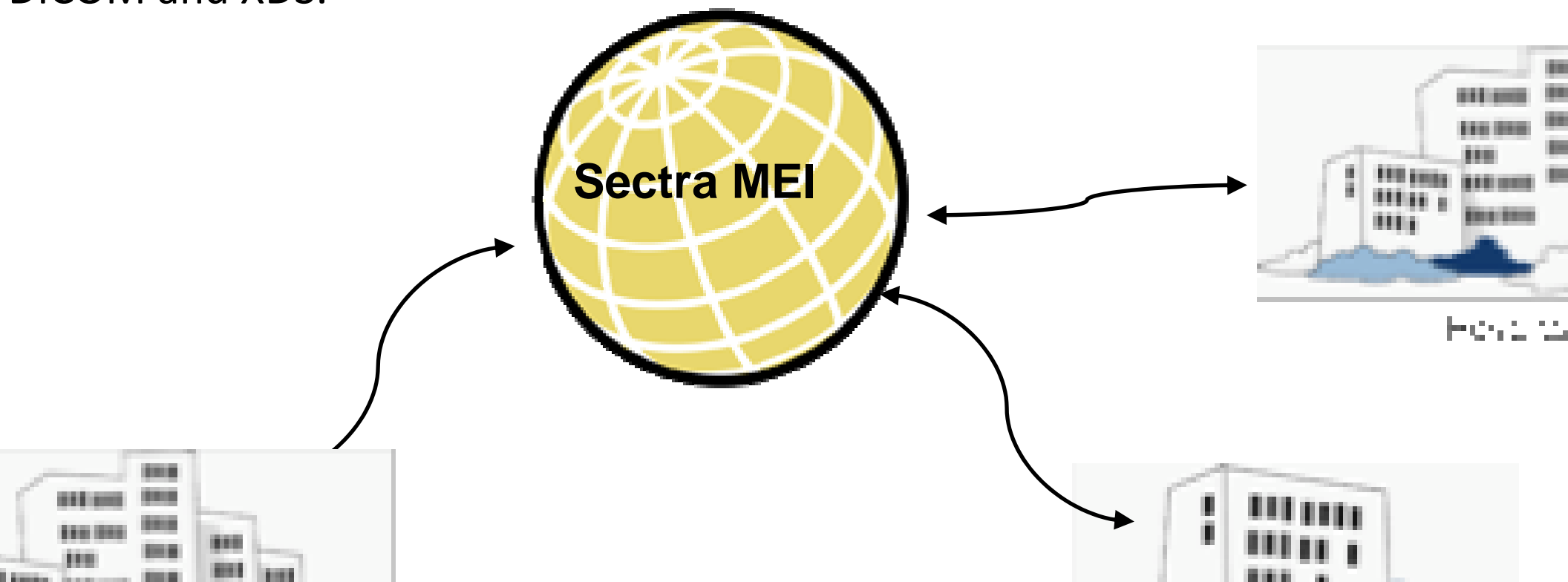
# Sectra Master Examination Index

- optimal Sharing and Distributed Workflow



# Sectra MEI for Distributed Workflows...

- A service that connects RIS and PACS, independent of vendor, to form a **NETWORK** of hospitals that easily can **SHARE** information and **WORKFLOW**
- Vendor neutral sharing is achieved through use of standards such as HL7, DICOM and XDS.





# Current Sectra MEI services

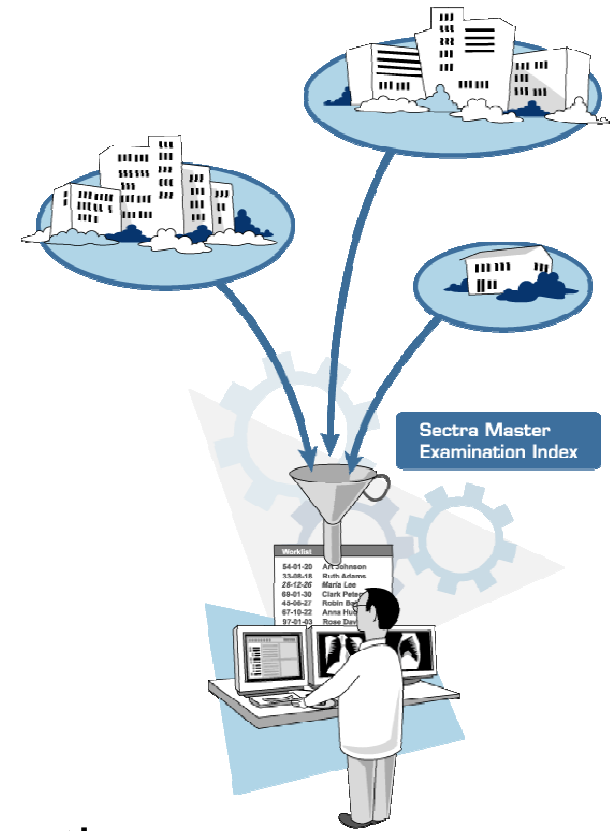
## Patient History

Reach referrals, reports and images through one service and from many sources

Compressed and encrypted data transfer

Tools for access control, patient consent and audit trails

One point of access to all other systems



## ✓ Distributed Reporting

- Use help from others when work piles up
- Increase effectiveness by sharing daytime reporting services
- Increase benefit from your specialists by offering expertise to others

# Spectra MEI in Scandinavia today

ed systems:

Agfa

estream

emens

RisCo

IRX

ectra



Data SIO, NOAA, U.S. Navy, NGA, GEBCO

- In total

connec

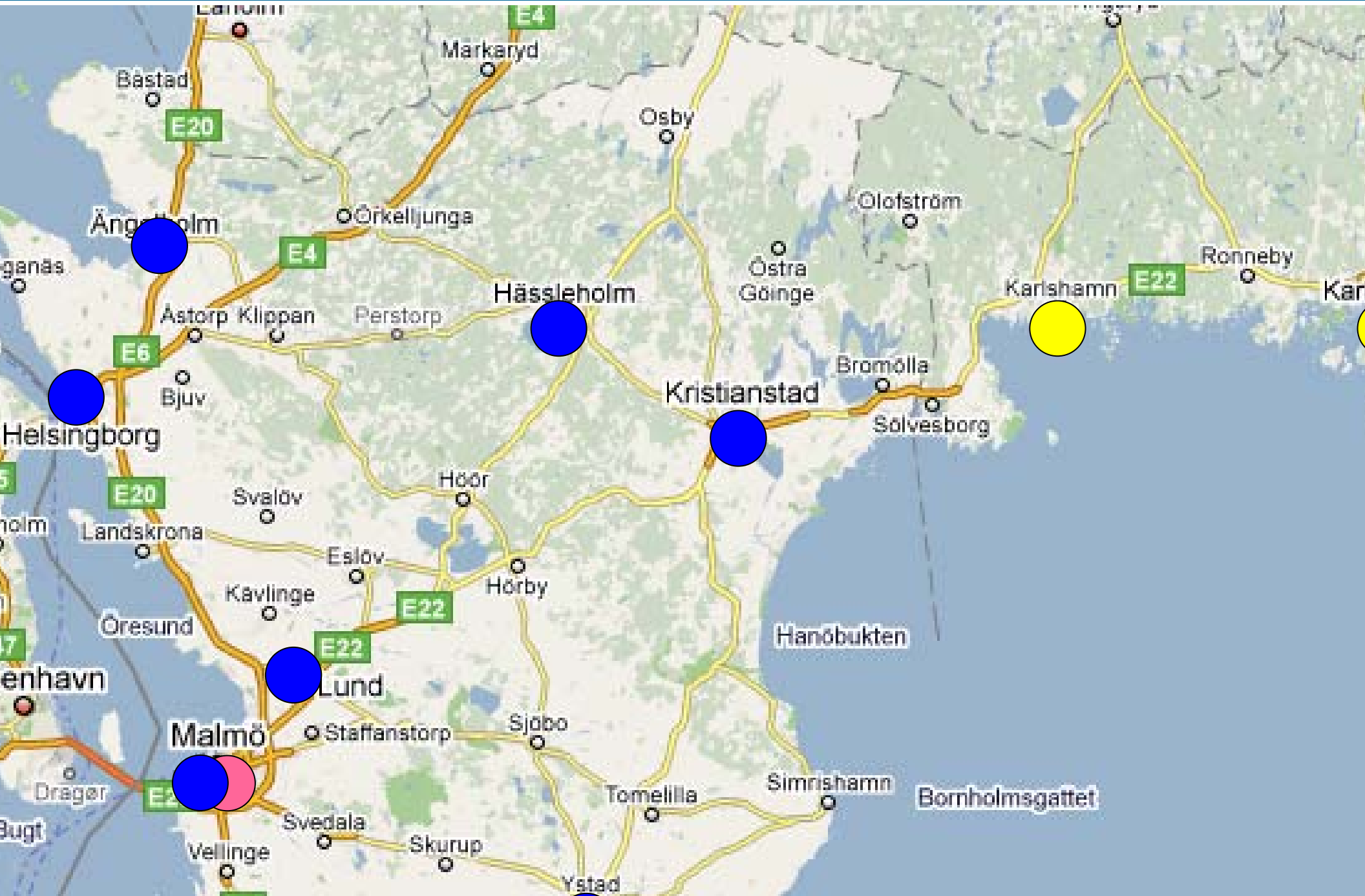
system

- Used b

radiolo

departme

# Sectra MEI in south Sweden



# Next step in Scania



Connecting the south health Region  
with MEI

Currently Scania Region and  
county of Blekinge



# Next step in Scania

Starting now discussions with

- Kronoberg county
- Halland county

+?



+?



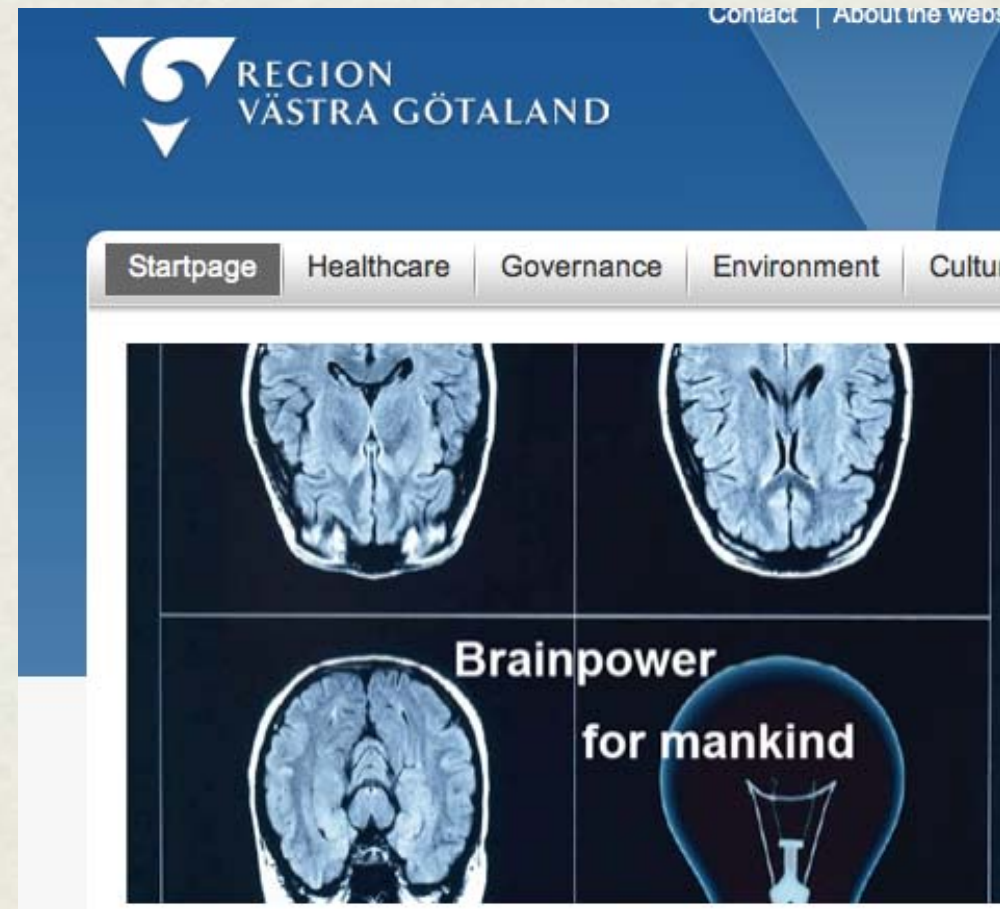
# Summary of South Sweden

## CANIA

- One PACS soon realized
- Still several databases requires a META-service MEI
- Connection to south Health Region
- Different PACS and RIS requires MEI

# Next step in Sweden

West Sweden analyses how to connect their systems. Today separate PACS storage that all PACS can reach by Q/R



# Next step in Sweden

Stockholm has to the best of my knowledge no official plan for how to connect their systems. Today to some extent M is used



**Stockholms läns landsting**

**Stockholm County Council**



# Next step in Sweden

Other counties has earlier integrated their systems



The image shows a screenshot of the website for Landstinget i Östergötland. The header is blue with the Landstinget logo (a white snowflake-like symbol) and the text "Landstinget i Östergötland". Below the header is a navigation bar with icons and text for "A-Ö", "Kontakta", "Kartor", "Tecken", and "I". The main content area features two service tiles. The left tile is for "1177 Sjukvårdsrådgivningen" with the text "Råd om vård" and a large red "1177" at the bottom. The right tile is for "Vårdcentraler" with the text "Hitta din vårdcentral" and an image of a doctor examining a child. Below each tile is a blue link: "[1177-Sjukvårdsrådgivning](#)" and "[Vårdcentraler](#)".

# Next step in Sweden

Northern Sweden tries to integrate more to HIS



# Inventory of PACS in Sweden 2008-2009

*Courtesy of Dr Johannes Arnesen, Sund*

# All departments now filmless and almost invariably paperless

2010-09-05

Över 70% av svenska sjukhus har samma RIS och PACS system. Med samma leverantör blir integreringen bättre samtidigt som att vi har en leverantör mindre vid kommunikationsproblem. Jag rekommenderar att vi noggrant gör en bedömning om det i längden inte är bättre med samma leverantör av RIS och PACS för att slippa 3 olika leverantörer.

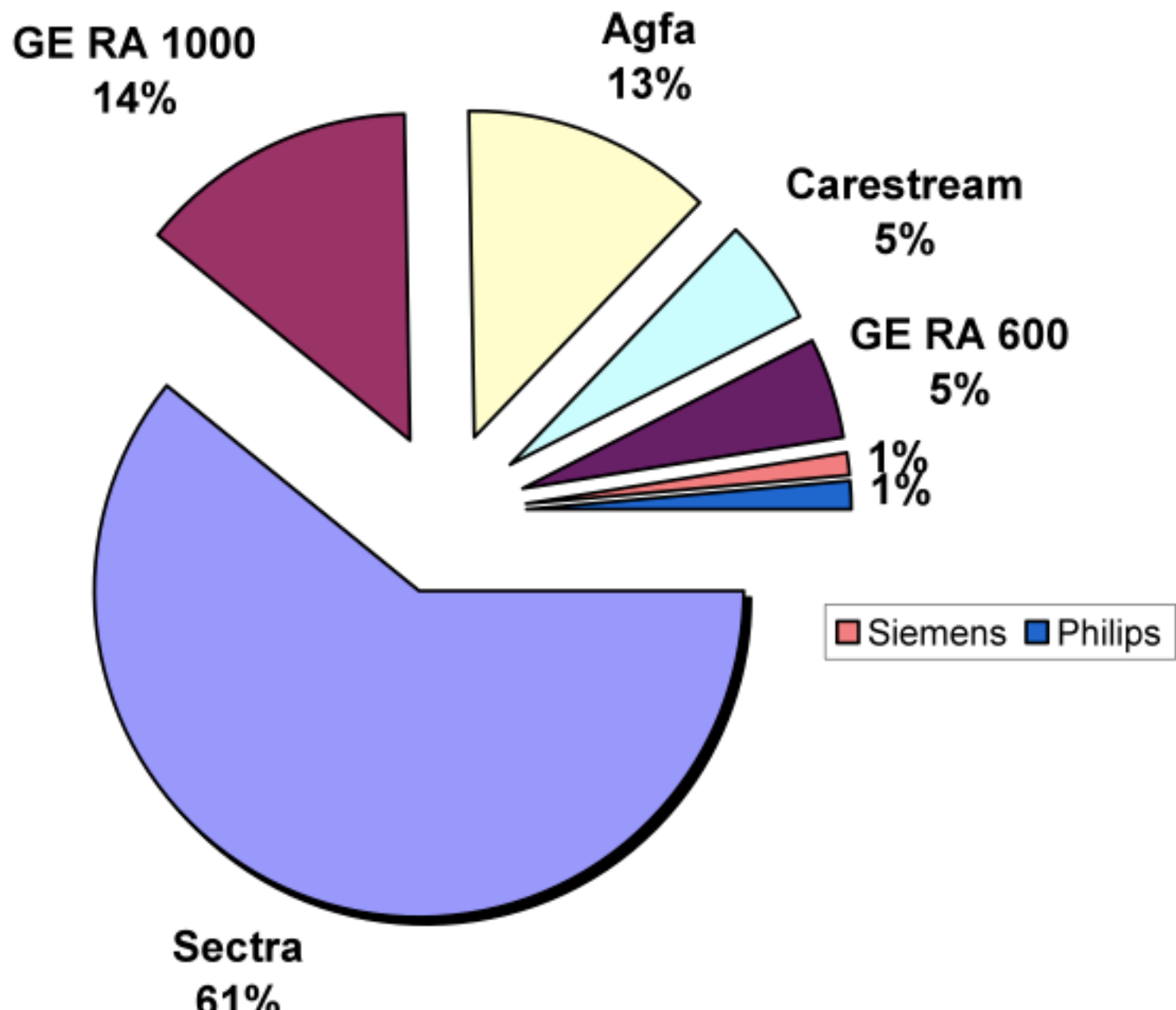
## IT-system vid svenska sjukhus

Sjukhus	Län	RIS	PACS	HIS
Blekingesjukhuset	Blekinge	Sectra	Sectra	System Cross
Avesta lasarett	Dalarna	Agfa	Agfa	Siemens Melior
Borlänge sjukhus	Dalarna	Agfa	Agfa	Siemens Melior
Palu lasarett	Dalarna	Agfa	Agfa	Siemens Melior
Ludvika lasarett	Dalarna	Agfa	Agfa	Siemens Melior
Mora lasarett	Dalarna	Agfa	Agfa	Siemens Melior
Visby	Gotland	Sectra	Sectra	
Gävle sjukhus	Gävleborg	Sectra	Sectra	Siemens Melior
Hudikervalls sjukhus	Gävleborg	Sectra	Sectra	Siemens Melior
Bollnäs sjukhus	Gävleborg	Sectra	Sectra	Siemens Melior
Halmstad	Halland	Carestream	Carestream	VAS
Varberg	Halland	Agfa	Agfa	VAS
Östersund	Jämtland	Sectra	Sectra	VAS
Eksjö	Jönköping	Agfa	Agfa	Cosmic
Jönköping	Jönköping	Agfa	Agfa	Cosmic
Värnamo	Jönköping	Agfa	Agfa	Cosmic
Kalmar	Kalmar	Sectra	Sectra	Cosmic
Oskarshamn	Kalmar	Sectra	Sectra	Cosmic
Västervik	Kalmar	Sectra	Sectra	Cosmic
Växjö	Kronoberg	Sectra	GE RA1000	Cosmic
Ljungby	Kronoberg	Sectra	GE RA1000	Cosmic
Gällivare	Norrbottnen	VAS	GE RA1000	VAS
Kalix	Norrbottnen	VAS	GE RA1000	VAS
Kiruna	Norrbottnen	VAS	GE RA1000	VAS
Piteå	Norrbottnen	VAS	GE RA1000	VAS
Sunderby	Norrbottnen	VAS	GE RA1000	VAS
Universitetssjukhuset i Lund	Skåne	Sectra	Sectra	Siemens Melior
Helingsborgs Lasarett	Skåne	Sectra	Sectra	Siemens Melior
Sjukhuset i Håsléholm	Skåne	Sectra	Sectra	Siemens Melior
Centralsjukhuset i Kristianstad	Skåne	Sectra	Sectra	Siemens Melior
Lasarettet i Landskrona	Skåne	Sectra	Sectra	Siemens Melior
UMAS - Malmö	Skåne	Sectra	Sectra	Siemens Melior
Simrishamns sjukhus	Skåne	Sectra	Sectra	Siemens Melior
Lasarettet Trelleborg	Skåne	Sectra	Sectra	Siemens Melior
Lasarettet i Ystad	Skåne	Sectra	Sectra	Siemens Melior
Ängelholms sjukhus	Skåne	Sectra	Sectra	Siemens Melior
Karolinska Universitetssjukhuset	Stockholm	Carestream	Sectra	
Södersjukhuset	Stockholm	Carestream	Sectra	Siemens Melior
Danderyds sjukhus	Stockholm	Dois	Philips	Siemens Melior

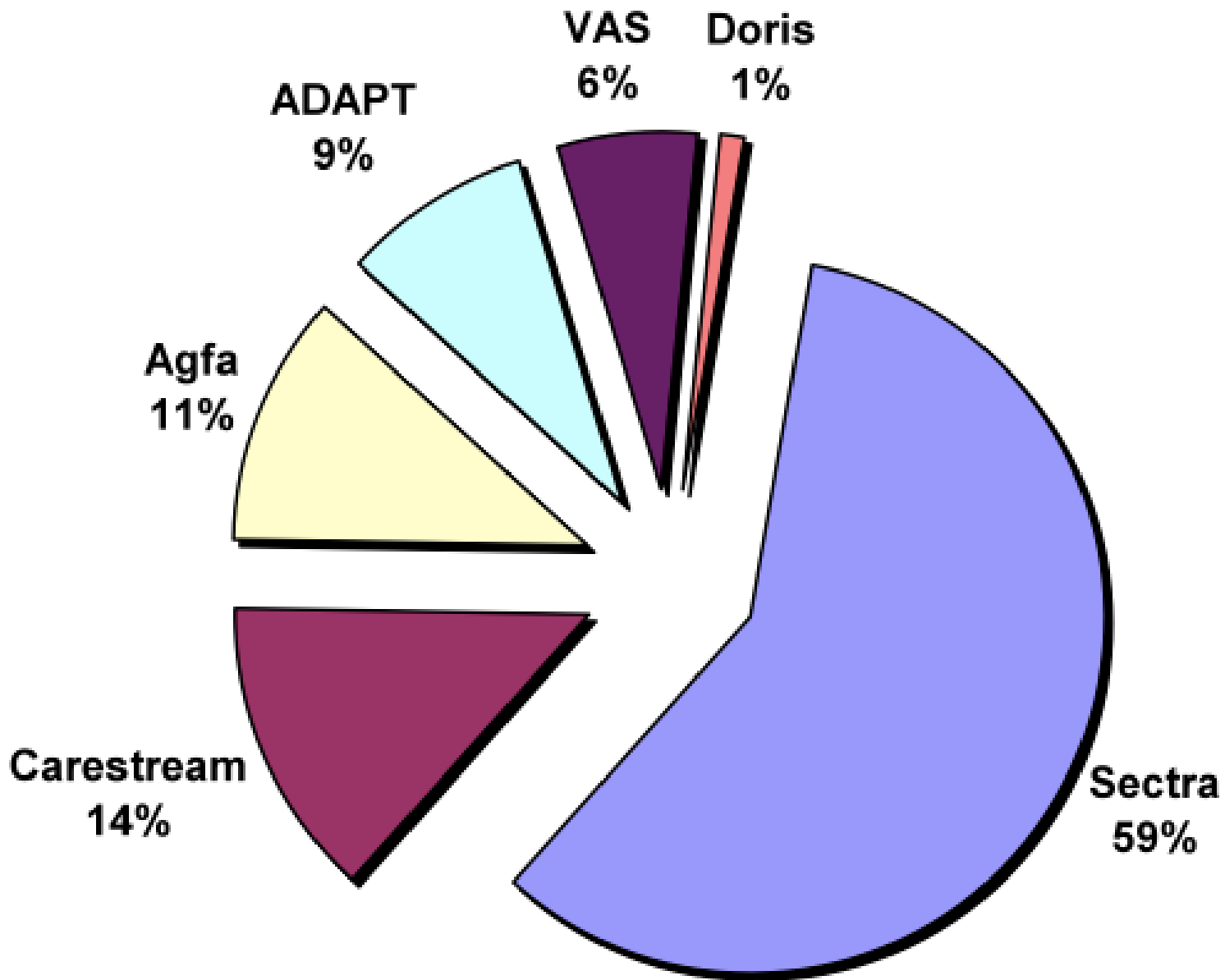
2010-09-05

Sjukhus	Län	RIS	PACS	HIS
Norrälje sjukhus	Stockholm	Carestream	Carestream	
St Görans sjukhus	Stockholm	Sectra	Sectra	Cosmic
Ersta diakoni - Sjukhus	Stockholm	Sectra	Sectra	
Sophiahemmet	Stockholm	Sectra	GE RA600	
Astrid Lindgrens Barnsjukhus	Stockholm	Carestream	Sectra	
Karsudden	Sörmland	Sectra	Sectra	System Cross
Kullbergsska	Sörmland	Sectra	Sectra	System Cross
Mälarsjukhuset	Sörmland	Sectra	Sectra	System Cross
Nyköping	Sörmland	Sectra	Sectra	System Cross
Akademiska	Uppsala	Carestream	Carestream	Cosmic
Enköping	Uppsala	Carestream	Carestream	Cosmic
Karlstad	Värmland	Sectra	Sectra	Cosmic
Arvika	Värmland	Sectra	Sectra	Cosmic
Kristinehamn	Värmland	Sectra	Sectra	Cosmic
Säffle	Värmland	Sectra	Sectra	Cosmic
Toesby	Värmland	Sectra	Sectra	Cosmic
Lyckeå	Västerbotten	Sectra	Sectra	System Cross
Umeå	Västerbotten	Sectra	Sectra	System Cross
Skellefteå	Västerbotten	Sectra	Sectra	System Cross
Härnösand	Västernorrland	Carestream	GE RA1000	System Cross
Sollefteå	Västernorrland	Carestream	GE RA1000	System Cross
Sundsvall	Västernorrland	Carestream	GE RA1000	System Cross
Önsköldsvik	Västernorrland	Carestream	GE RA1000	System Cross
Västerås	Västmanland	Sectra	Sectra	Cosmic
Fagersta	Västmanland	Sectra	Sectra	Cosmic
Köping	Västmanland	Sectra	Sectra	Cosmic
Sala	Västmanland	Sectra	Sectra	Cosmic
Västerås närsjukhus	Västmanland	Sectra	Sectra	Cosmic
Sahlgrenska	Västra Götaland	ADAPT	GE RA600	Siemens Melior
Östra Sjukhuset	Västra Götaland	ADAPT	GE RA600	Siemens Melior
Mölndal	Västra Götaland	ADAPT	GE RA600	Siemens Melior
NU-sjukvården	Västra Götaland	ADAPT	Agfa	Siemens Melior
Skaraborgs sjukhus	Västra Götaland	ADAPT	Siemens	Siemens Melior
Kungälv sjukhus	Västra Götaland	ADAPT	Sectra	Siemens Melior
Frölunda specialistsjukhus	Västra Götaland	ADAPT	GE RA600	Siemens Melior
US i Örebro	Örebro	Sectra	Sectra	Siemens Melior
Karlskoga Lasarett	Örebro	Sectra	Sectra	Siemens Melior
Lindesbergs lasarett	Örebro	Sectra	Sectra	Siemens Melior
US i Linköping	Östergötland	Sectra	Sectra	Cosmic
Vrinnevisjukhuset - Norrköping	Östergötland	Sectra	Sectra	Cosmic
Lasarettet i Motala	Östergötland	Sectra	Sectra	Cosmic

# PACS - Picture Archiving and Communication System

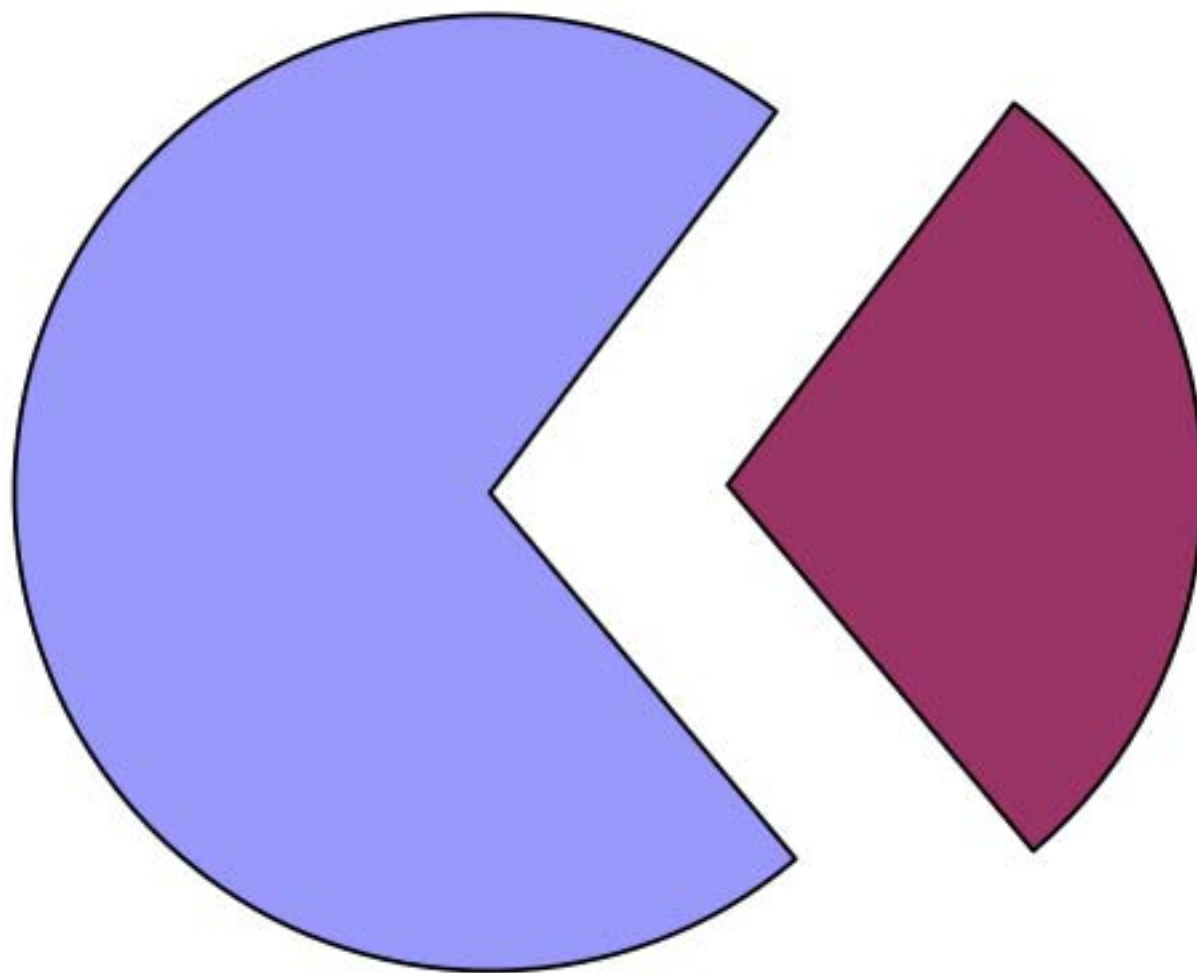


# RIS - Radiology Information Systems



**Same system**

**71%**



**Different system**

**29%**

**Thank You**