

Towards interoperable clinical systems Evolution or revolution?

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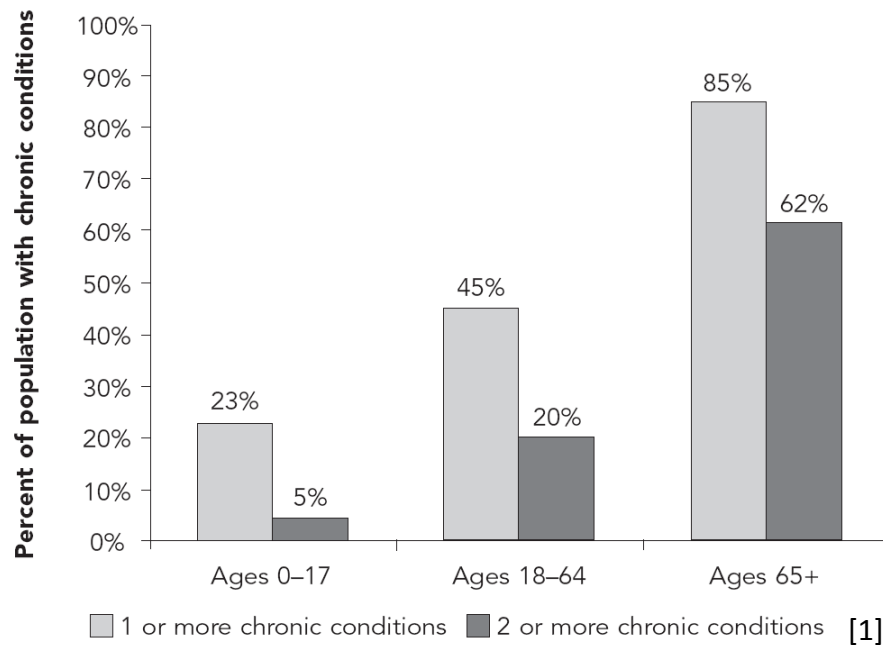
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Agenda

- Our health prospects, as we age
- The health service need and the expected support ratio
- So, what have we done the last ten years?
- Interoperability - what is the problem?
- What do we need to do the next ten to meet the needs?
- My claims
- My advice

Our health prospects

Prevalence of chronic conditions USA 2004



Our health prospects

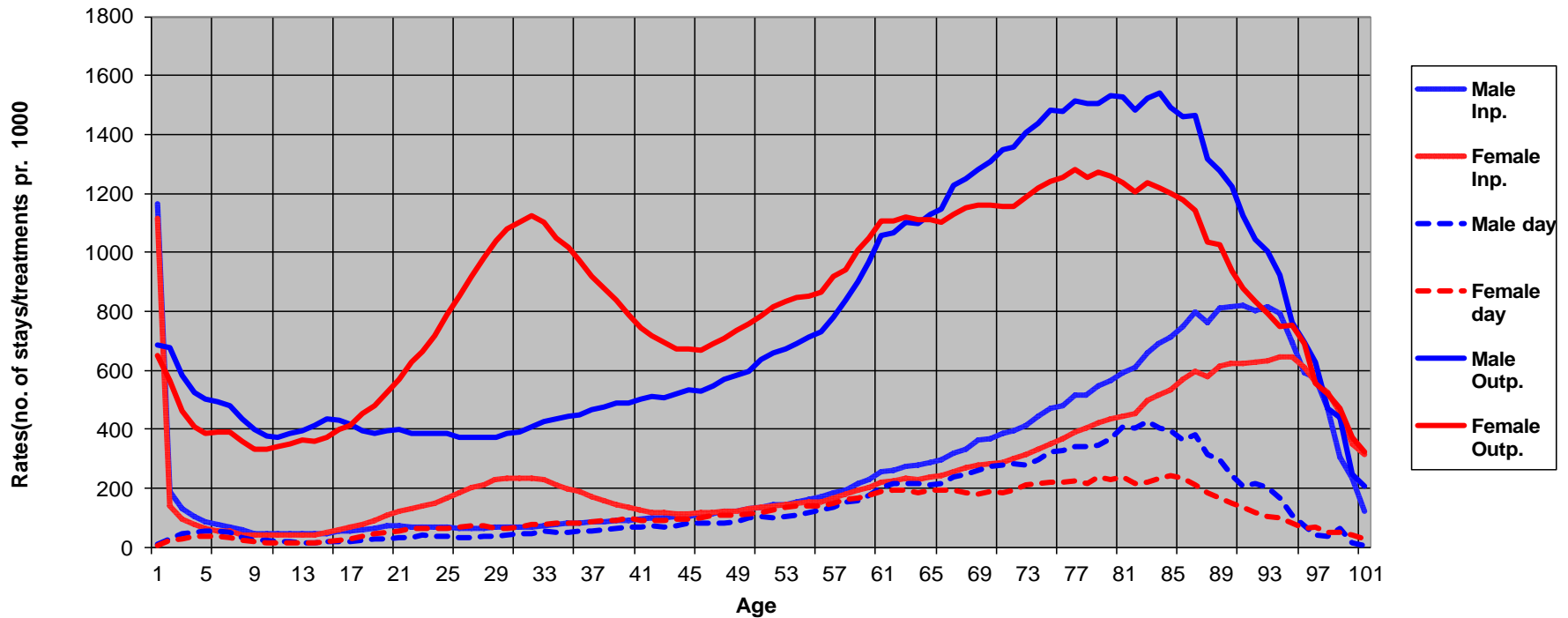
In Canada, 60%–80% of general medical costs are related to the care of persons with chronic disease^[1].

[1] Rapoport J, Jacobs P, Bell NR, Klarenbach S. Refining the measurement of the economic burden of chronic diseases in Canada. *Chronic Dis Can.* 2004;25(1):13-21.

Our health prospects

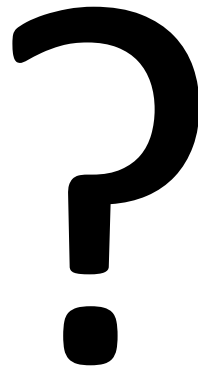
Rates hospital usage pr. age Norway 2002-2006

Weighted for no. of inhabitants



Our health prospects

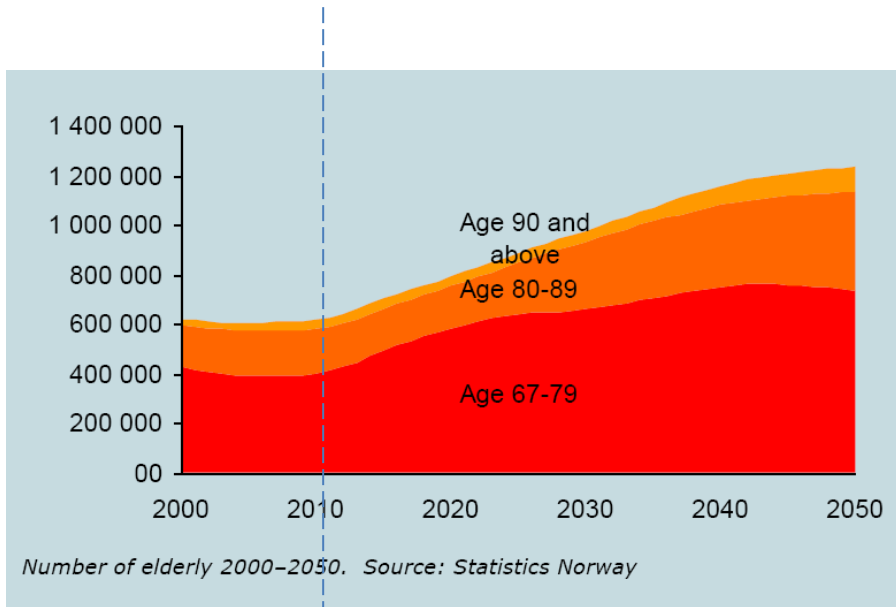
Rates of primary care service usage pr. age in Norway



Does anybody in the audience know?
If nobody knows, why dont we know?

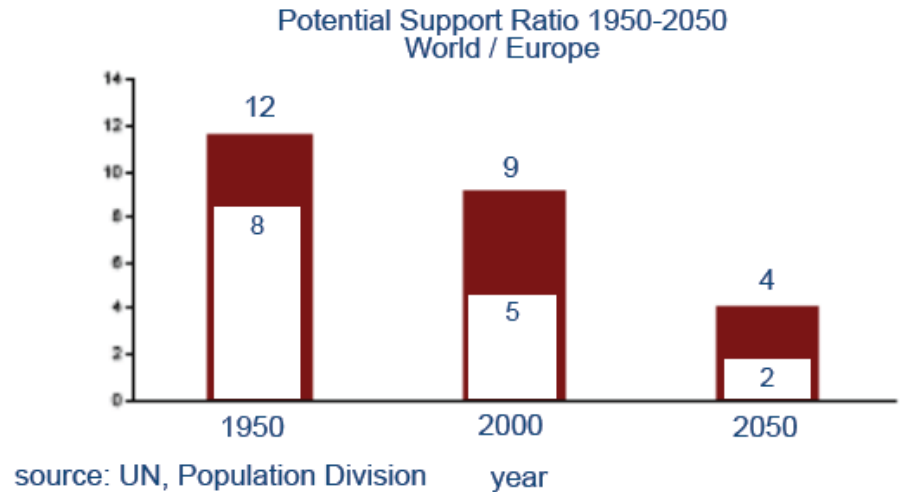
Health service needs forecast

Expected support ratio

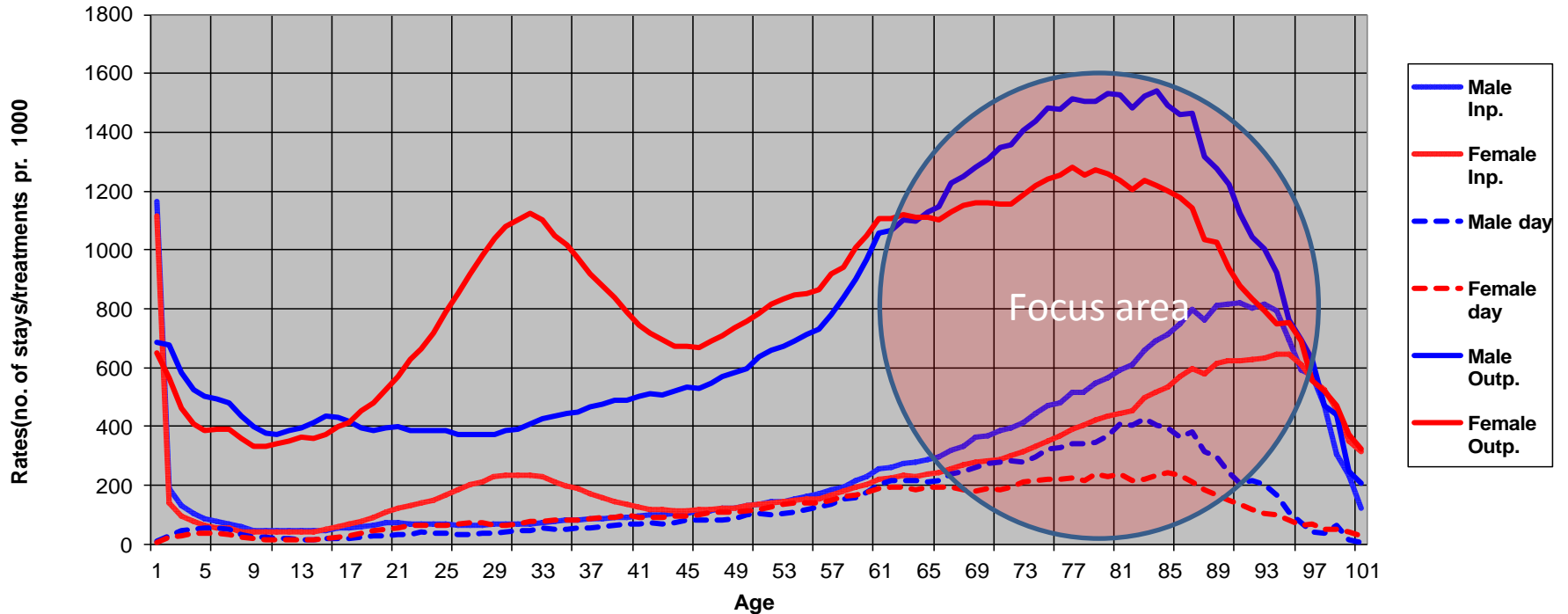
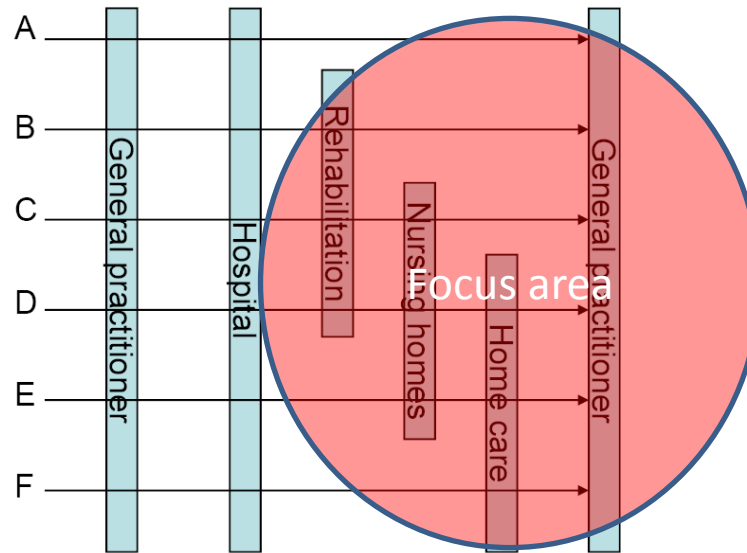


Now

the demographic change



Patient pathways and future needs



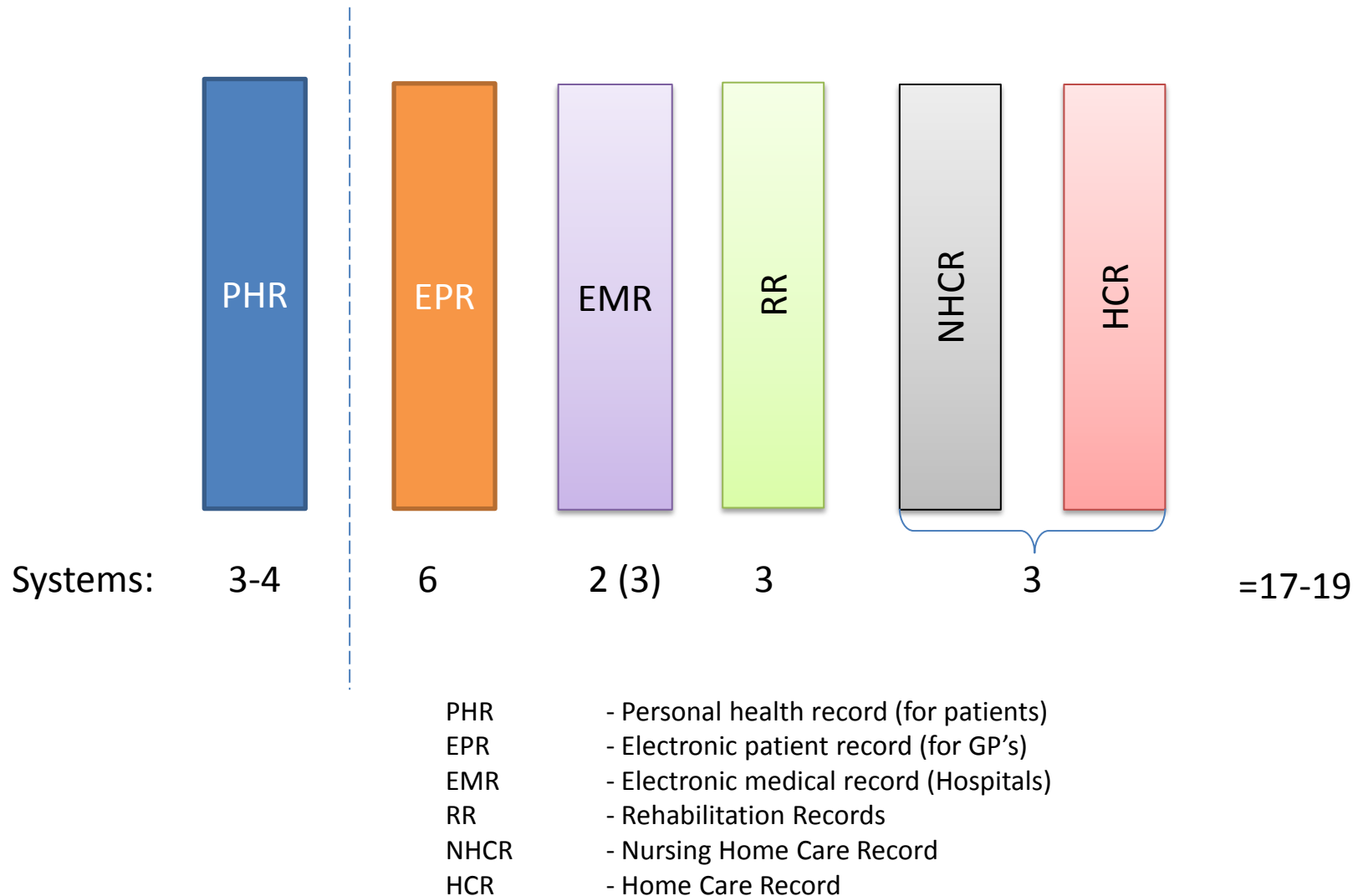
What do we need to do?

- Patients must be allowed to do part of the job of staying healthy!
 - Diabetics
 - COPD
 - CHF
- Good thing is, giving patients the knowledge and responsibility also seems to influence the medical outcome in a positive direction.

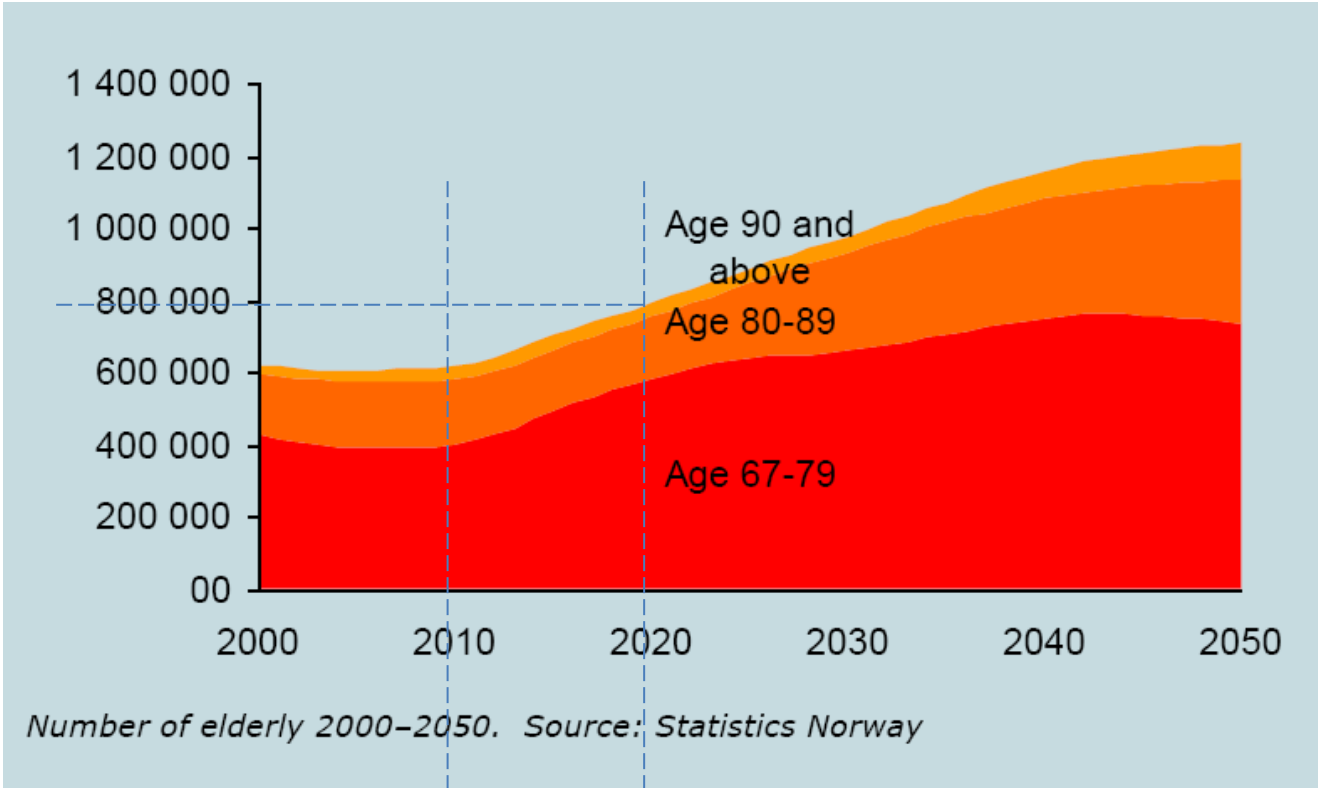
What do we need to do?

- Structure our EHR systems to support
 - Clinical Decision Support
 - Evidence Based Clinical Guidelines
 - Research
 - Disease surveillance
 -

We need structured interoperable systems



So, what have we done the last ten years?



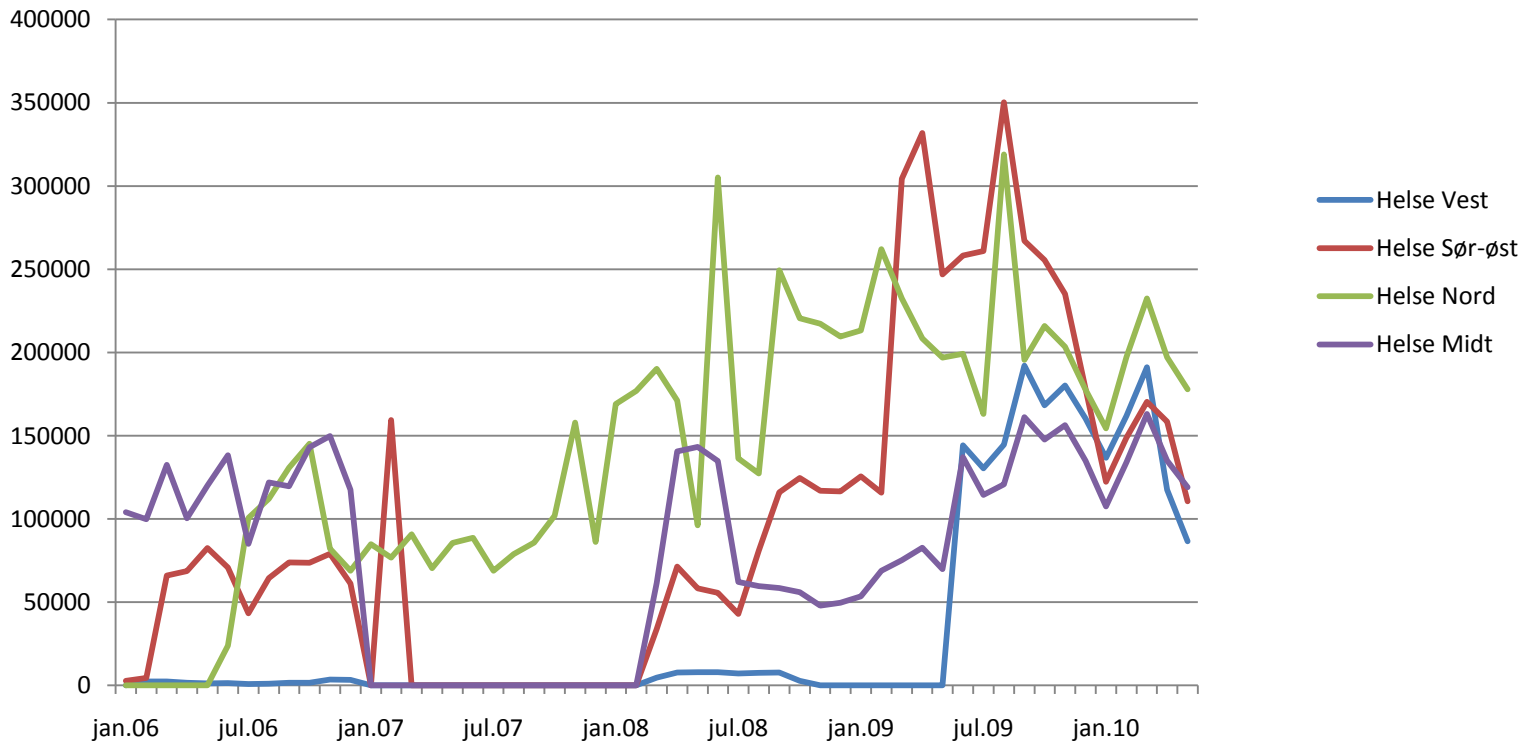
Now

So, what have we done the last ten years?

The 20th of June 2000 the first XML based discharge letter were transferred electronically from the University Hospital of North Norway to a GP office, Sentrum Legekontor in the centre of Tromsø, using software developed at Norwegian Centre for Integrated care and Telemedicine.

So, what have we done the last ten years?

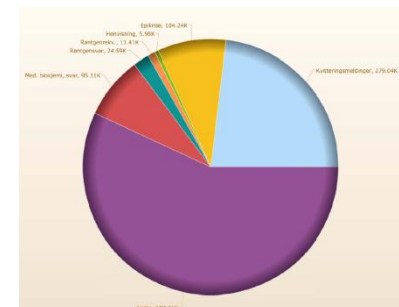
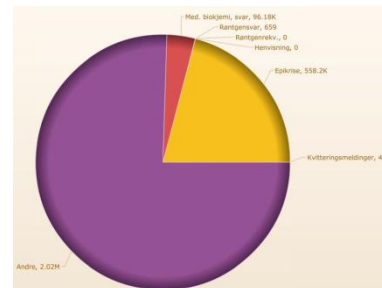
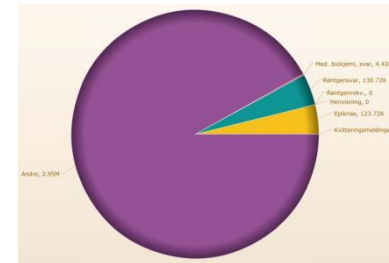
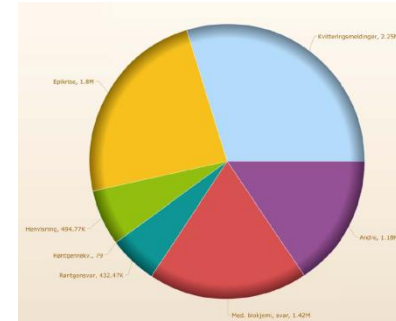
Messages in the Norwegian health net
January 2006 - May 2010



So, what have we done the last ten years?

Messages types

- Discharge letters
- Referrals
- Radiology request / reply
- Bio-chemistry
- Others
- Message acknowledgement



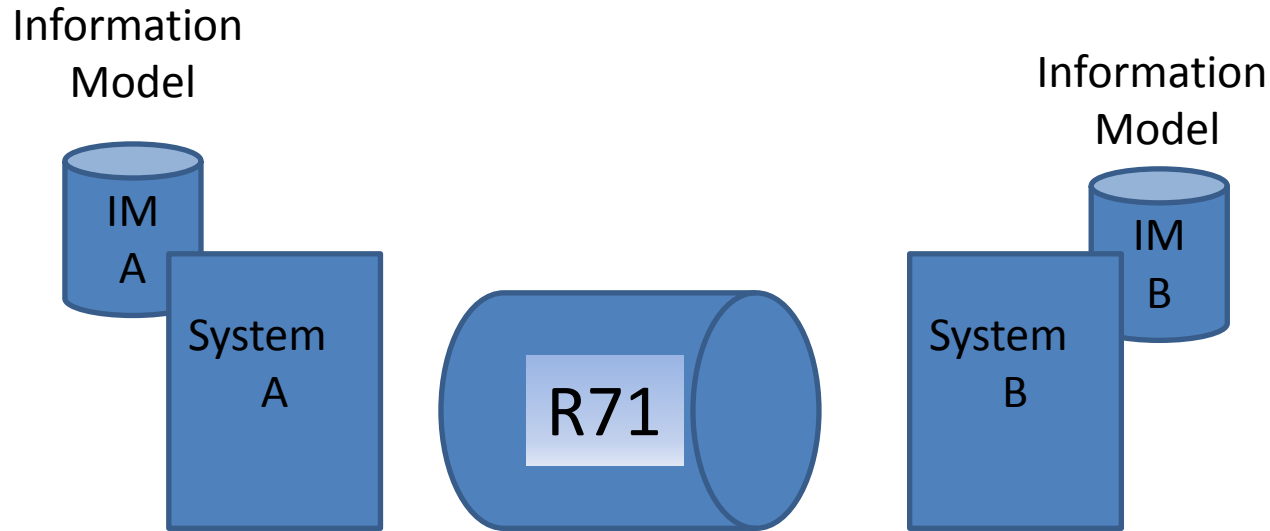
So, what **more** have we done the last ten years?

- Discussed.... need, security, privacy...
- Fixed the adress registry (2009)
- Fixed the legislation (2010)
-

Progress is hindered by

- Many actors and systems lead to complexity
- Many projects and interdependencies between them
- Lack of resources for implementors

How can we achieve interoperability?



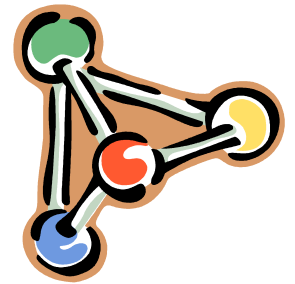
Interoperability \Rightarrow IM A = IM B

What does R71 mean?

Information models in healthcare

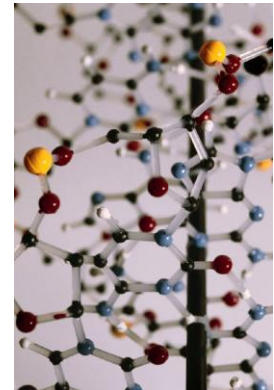
Requirements:

- Stable over time
- Simple and implementable



The reality:

- Constant change
- Increasingly complex



Problem

Change factors in medicine have been characterized by Rector as follows: Not only is medicine big, it is open-ended:

1. *In breadth*, because new information is always being discovered or becoming relevant
2. *In depth*, because finer-grained detail is always being discovered or becoming relevant
3. *In complexity*, because new relationships are always being discovered or becoming relevant.



My claims

Binding software to information content

If the medical software is tied to the information content handled in the system (implicit model), then medical software needs to change constantly

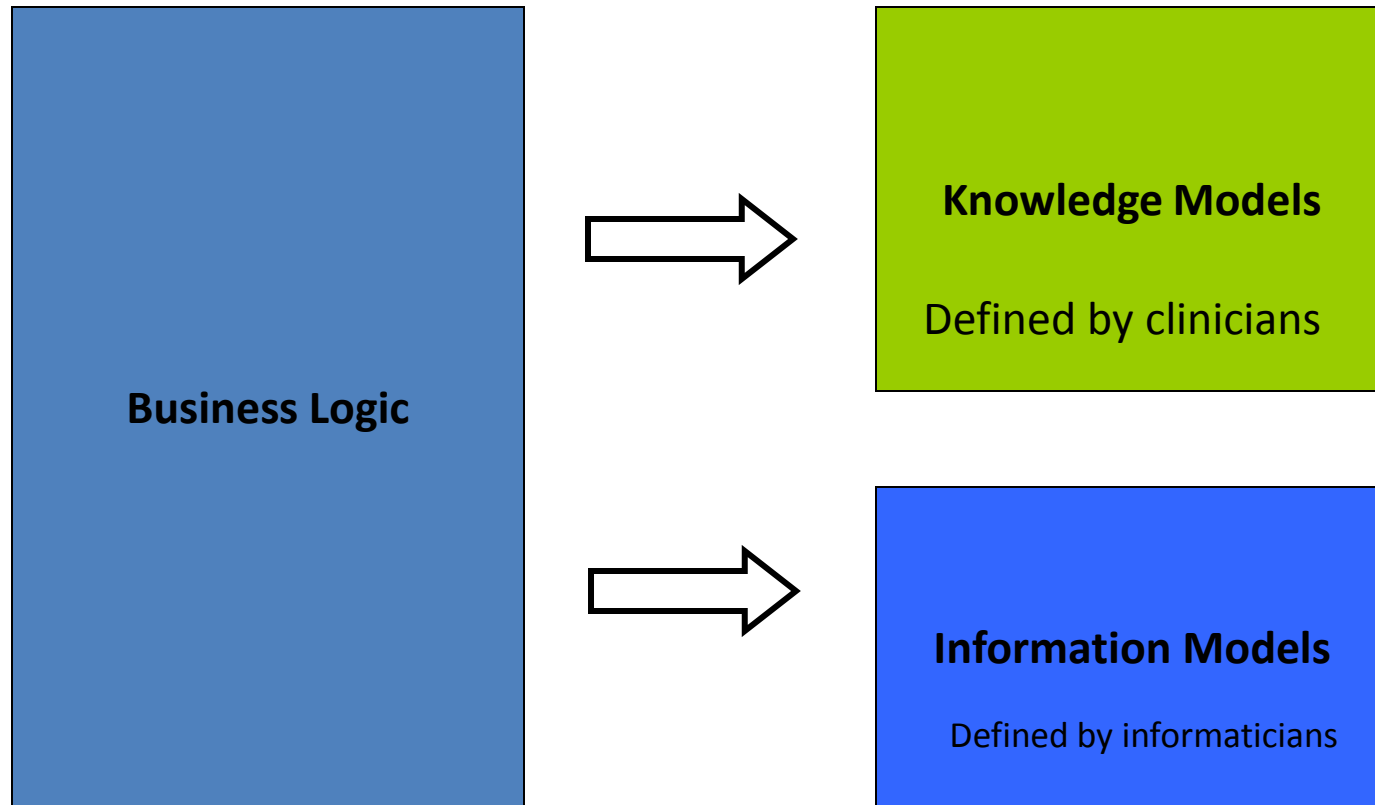
- Brilliant business model for EHR vendors

The single information model is doomed to change as medical knowledge expands.

- Brilliant business model for information architects
- The model will collapse because of the complexity
- *We will never achieve stable interoperable systems following these strategies*

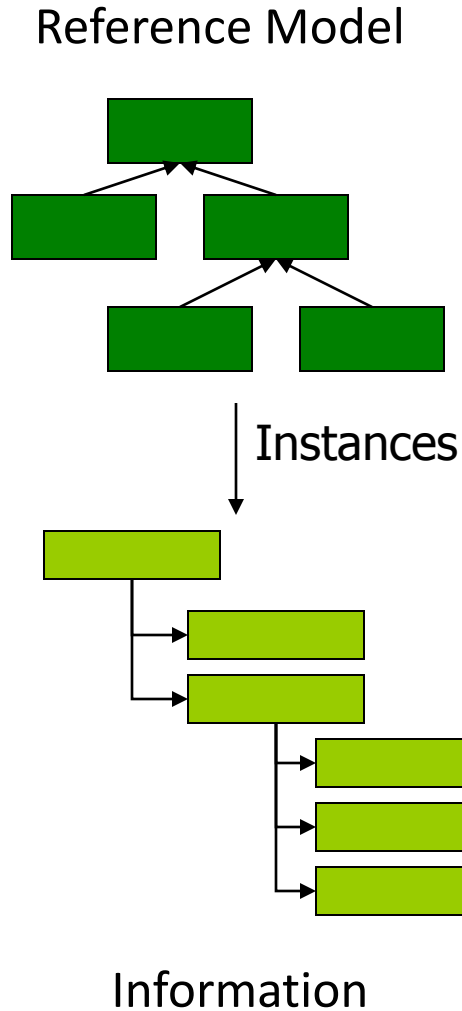
My suggestion: Use Two-Level Modelling

“Separation of Information and Knowledge”

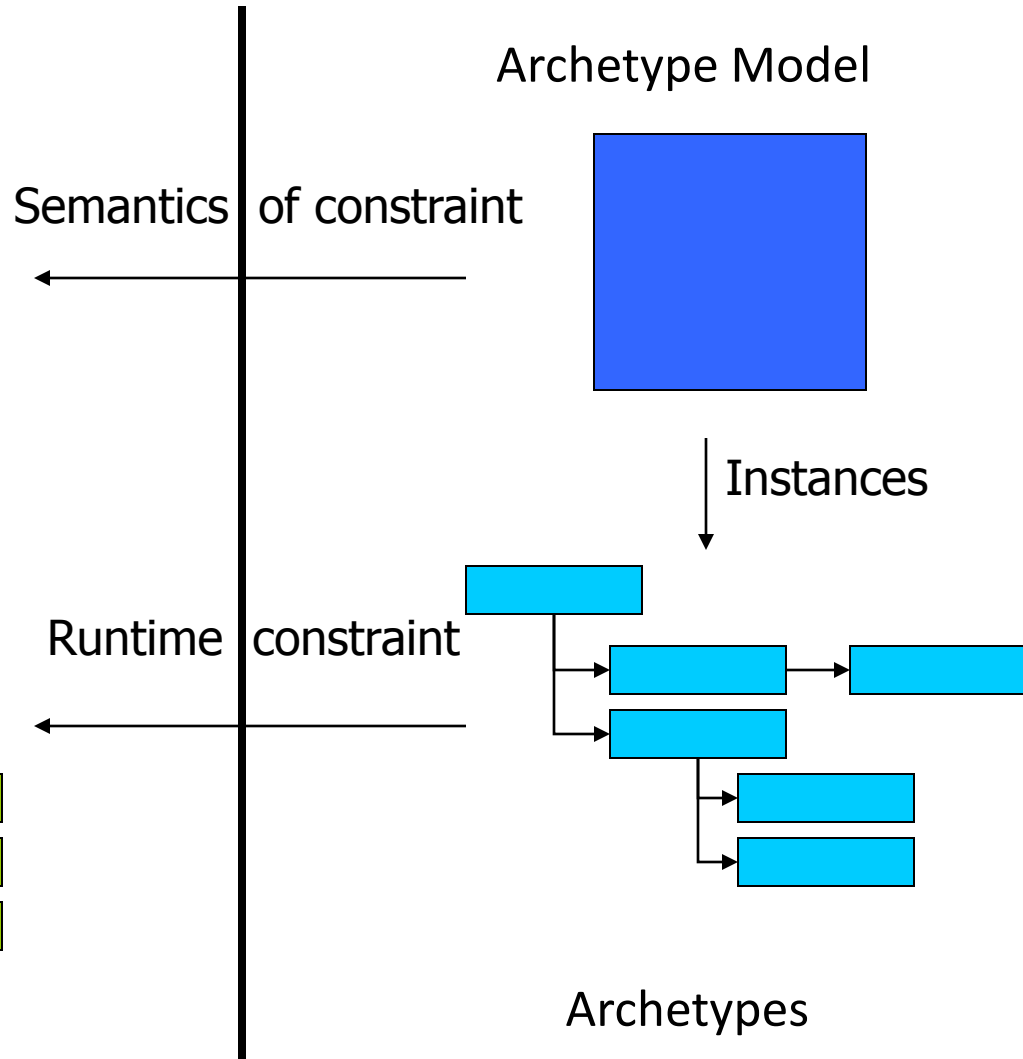


Source: Rong Chen, Guest lecture at UiT, IFI, June 2008. **Two level modelling and ‘future-proof’ information system**

Information



Knowledge



What can we do?

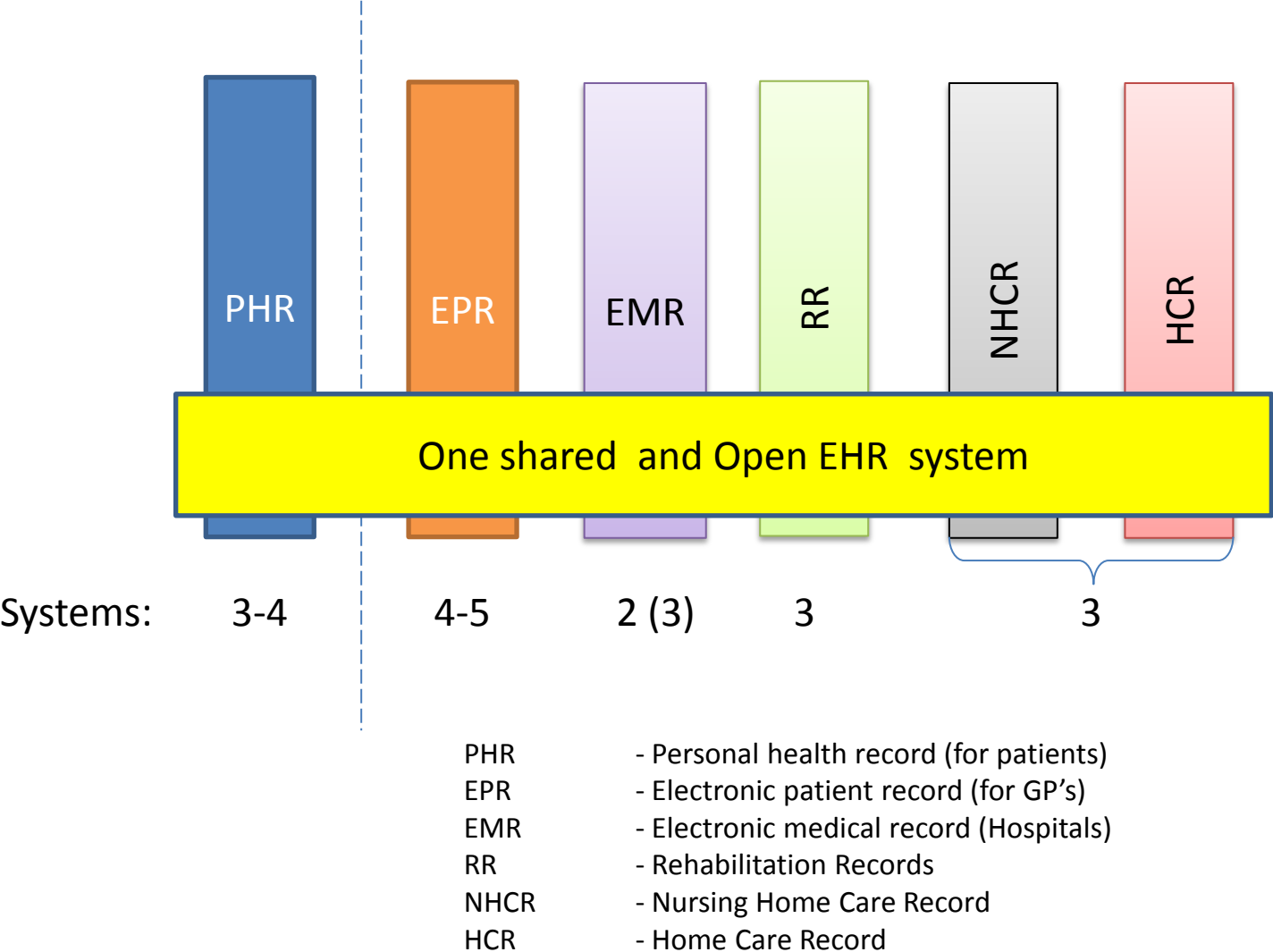
My advises for the next ten years

- Let clinicians define the clinical information models in the EHR system, they know their domain
- Use the two level modelling method for EHR systems
- => adopt the OpenEHR methodology

- Ban closed and proprietary systems in healthcare
 - We don't have time to evolve all systems into interoperability
 - We really need to know what is going on in the health service

- Let the vendors work on one common and open software repository for EHR software
 - They have the knowledge, experience and skills to do it

We need interoperable systems



Conclusion

We don't have time for evolution!

We must choose revolution!

Thank you for listening 😊