

# EHRC Research Colloquium

13.3.2007

*“ICT enabling better care in  
complex systems”*

Bruce Barraclough AO  
Medical Director, CSIRO ICT Centre  
Chair, NSW Clinical Excellence Commission

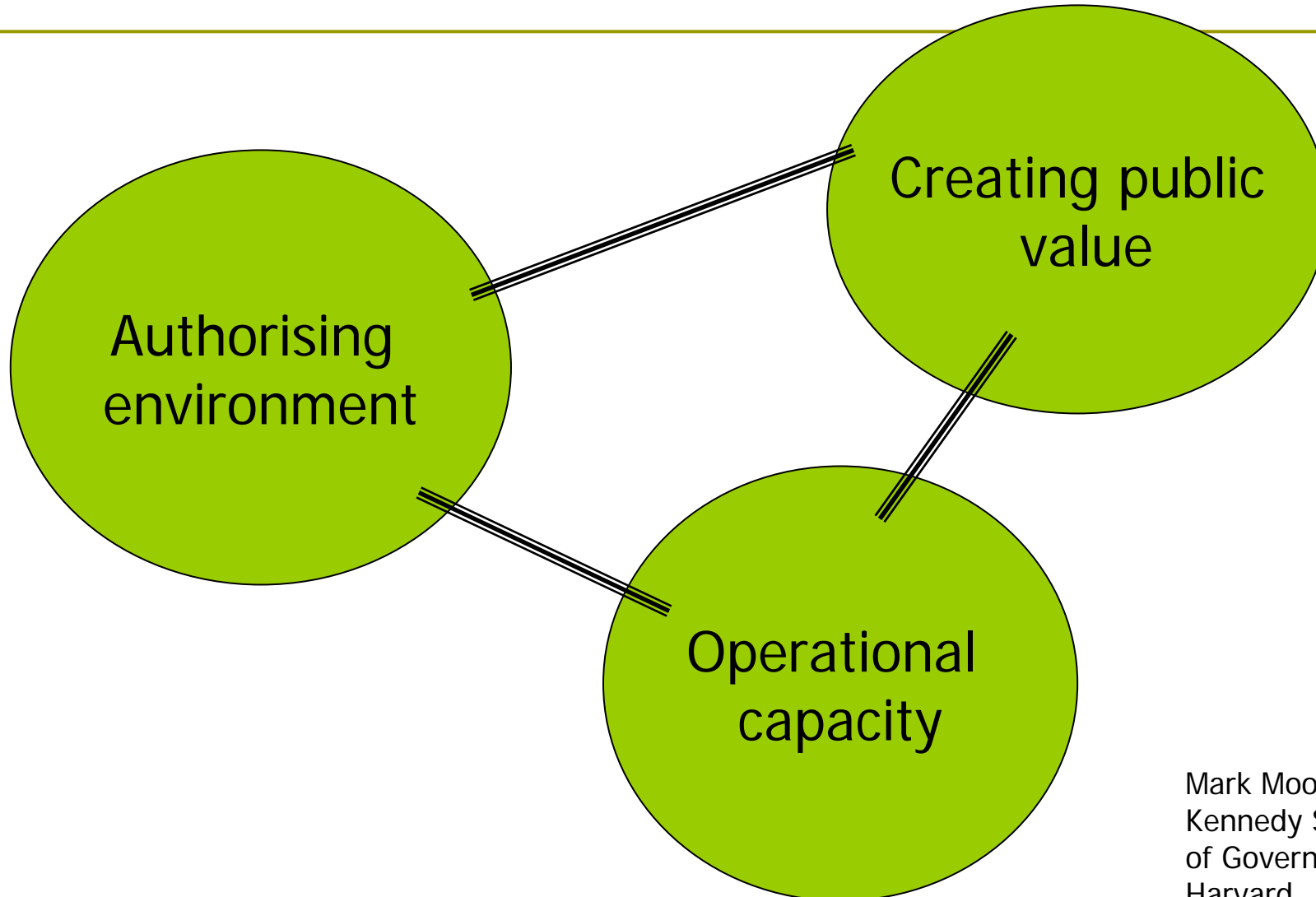
# Health care context

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- Complex adaptive systems: Families, practices and hospitals are all complex adaptive systems
  - *collection of individual agents with freedom to act in ways that are not always totally predictable, and whose actions are interconnected so that one agent's actions changes the context for other agents*

# Creating Public Value

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Mark Moore 2003  
Kennedy School  
of Government  
Harvard

# What is needed for quality health care?

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- Safety
- Appropriateness
- Access
- Consumer centredness
- Effectiveness
- Efficiency

*Health professionals with competencies to support this agenda*

# “Charting the Safety and Quality of Care in Australia”

Australian Council for Safety and Quality in Health Care - 2004

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- ❑ Immunisation rates of vaccine preventable disease 91.5% at 24 months of age (2003)
- ❑ Mortality rates for cervical cancer reduced by 50% since 1980
- ❑ Mortality from coronary artery bypass graft 1.78%
- ❑ 1.3 anaesthetic related deaths for every 100,000 anaesthetic procedures (1997 – 1999)
- ❑ 13 maternal deaths per 100,000 confinements (1994 – 1996)
- ❑ Overall mortality from heart attack fell by 34% (1994 – 2001)

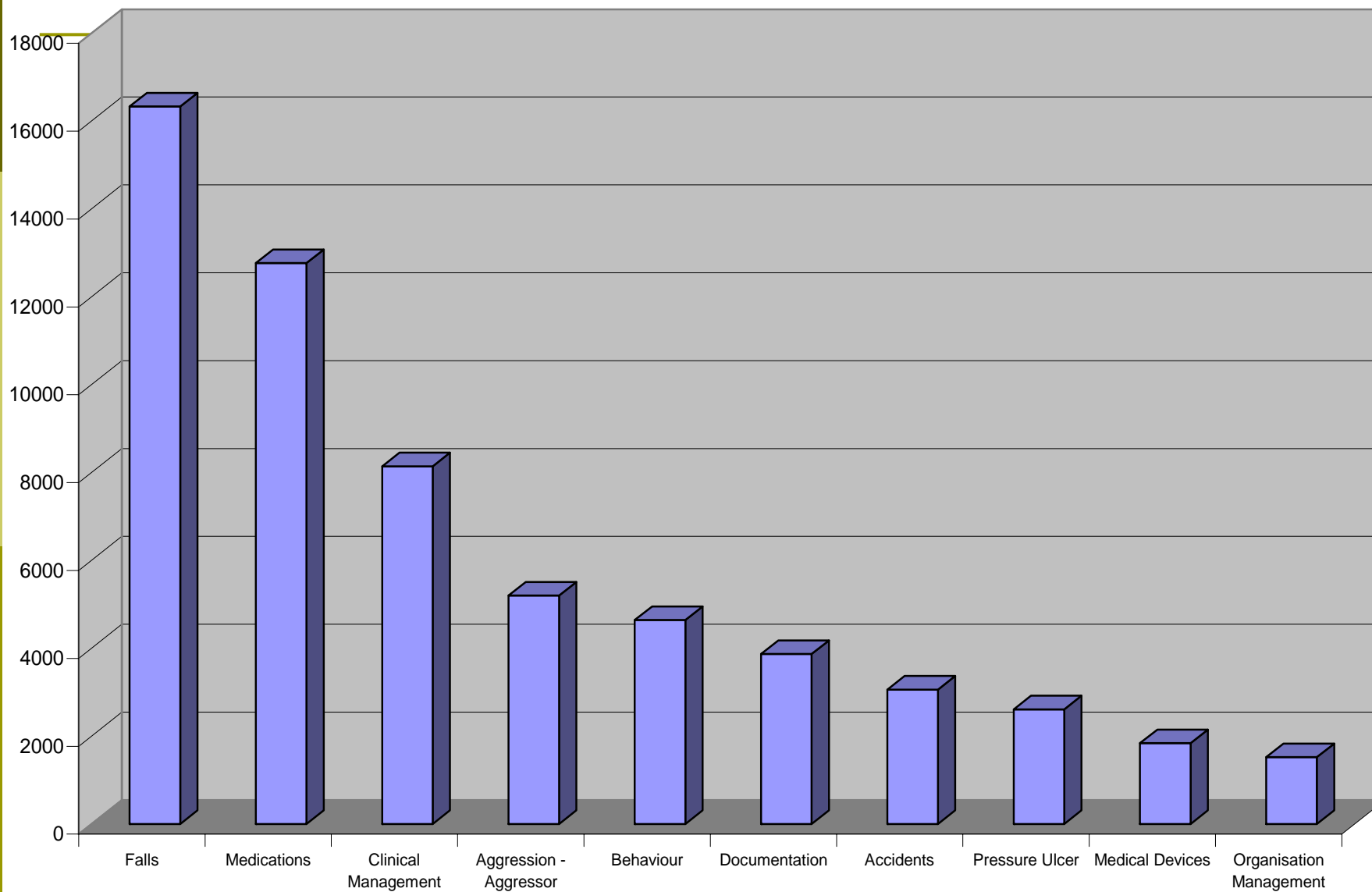
# Quality measures – stimulus for change

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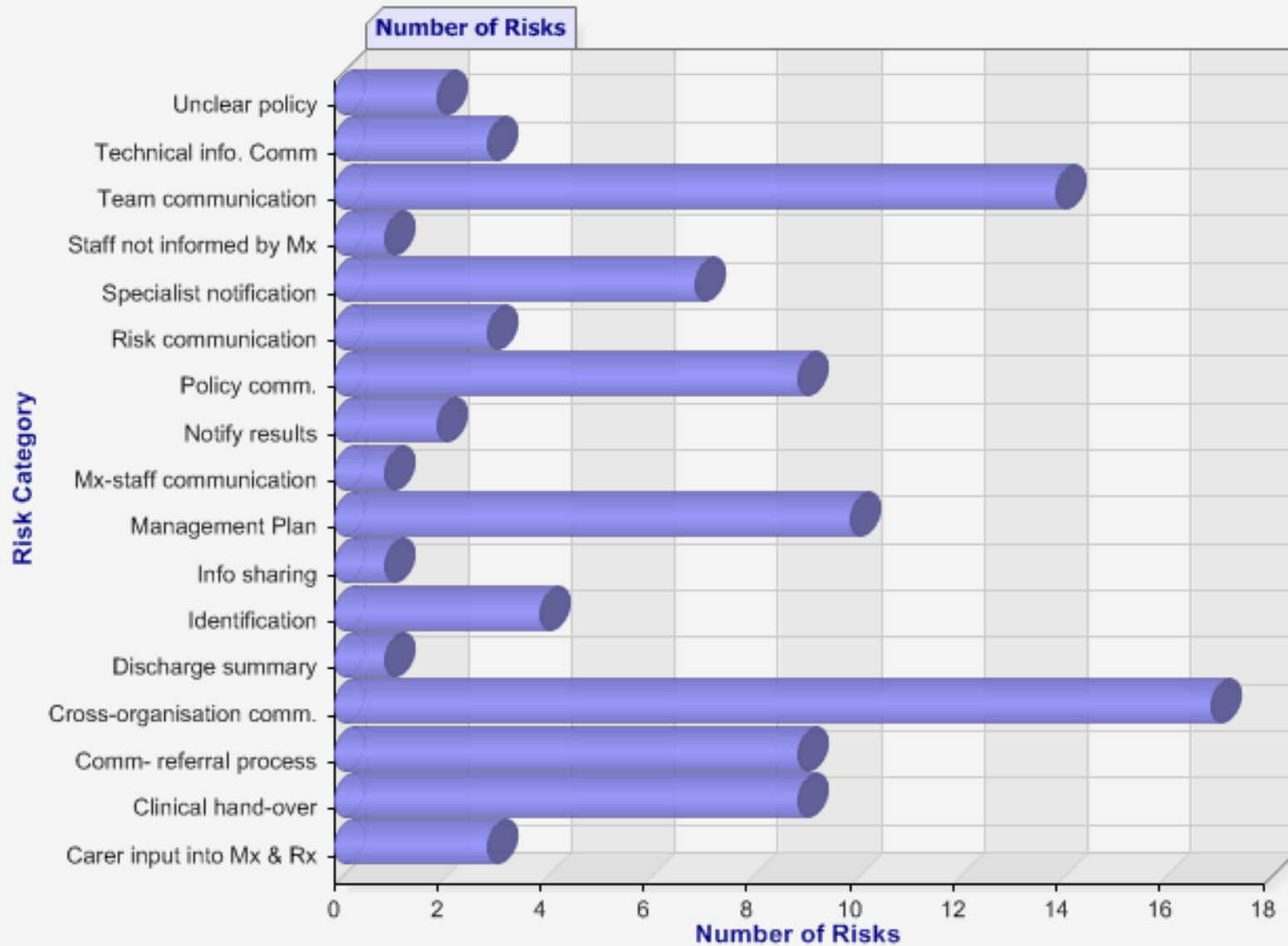
- Adverse events 10%
  - Severe disability 2%
  - Death 0.3%

} 30 – 50% preventable
  
- Appropriateness 50% receive appropriate care  
(McGlynn, Rand)
  - Under-use
  - Misuse
  - Over-use
  
- Work force capacity to meet care needs?

# TOP 10 Clinical Principal Incident Types Jul 05 – Mar 06




# Risks associated with Communication



# Insights from error studies

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- ❑ Human fallibility can be moderated but not eliminated
- ❑ We can't change the human condition but we can change the conditions under which people work
- ❑ Recognise that most problems are based in the system
- ❑ Encourage reporting in a “safe” environment in which to identify and correct errors
- ❑ Build better systems that anticipate, detect, forgive and recover error.



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*“In any large system, some people are getting better results than others. If you examine what they are doing, you can distil the anatomy of the system. Then others can take those ideas and adapt them for use in their own environment”*

Sir John Oldham  
Improvement Foundation

# Australian Council for Safety and Quality in Health Care activity

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An ability to measure, understand and make beneficial change:

- ❑ National system for collection and analysis, reporting and correcting the causes of severe adverse events
- ❑ Consistent incident monitoring and management systems across all States and Territories
- ❑ Development of a national data set for patient safety



**Safety+Quality**  
COUNCIL



# National **Patient Safety** Education **Framework**



# Seven learning topics

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1. Communicating effectively - communicating risks
2. Identifying, preventing & managing adverse events and near misses - managing risks
3. Using evidence & information - using IT to enhance safety
4. Working safely - teamwork, understanding human factors, managing fatigue & stress
5. Being ethical - maintaining fitness to practice
6. Continuing learning - as learner /teacher
7. Specific issues- preventing wrong procedures  
- medication safety

# Simulation in skills laboratories

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- ❑ The way forward for training, retraining & assessment of trained surgeons: but,
- ❑ Still need further research and evaluation to conclusively prove:
  - Instructional effectiveness i.e. repeated use improves performance
  - Construct validity i.e. that simulation measures the skills it is designed to measure
  - Predictive validity & reliability in skills assessment
  - Multiple types to be tested – computer/video/models/cadaver
- ❑ Ultimate validation – does simulation training positively influence patient outcomes?

# Current CSIRO science outcomes for the health system

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- Making data “work” as useful information
- Improved and earlier diagnosis
- Privacy and security of information
- Wireless and sensor enabled environments
- Linking people and places – clever networks
- Tele-presence and virtual reality training tools

# The health system agenda that informs new science opportunities

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- Workforce / access
- Ageing and expectations
- Prevention (includes obesity)
- Early intervention
- Equity of outcome irrespective of where or how care is accessed

# Key opportunities in ICT and e-Health Research


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- Demonstration of scalability and sustainability of current science outcomes in multiple sectors
- Understanding complex interactive systems (human factors)
- Educational research based around virtual reality tools and robotics

# The Challenge

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- The status quo is not an option as the world keeps changing
- **The challenge is to shape and drive the many futures that may be ahead**
- Designing and influencing policy / practice /workforce / technology: **is the way forward**



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*“Beware the tranquilizing  
drug of gradualism”*

Martin Luther King