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Surgical Waiting Lists in Australia hit the headlines. Mark Mackay

A key story in The Australian (21 March 2005 page 1) reported trends in waiting times for surgery. Data came from the [Australian Institute of Health](#) and from contact with individual governments. Four states provided comparative data. The histograms show how the average waiting time for the first 50% and the last 10% of operations shifted in four states between 2002-03 & 2003-04.

Only New South Wales decreased 50% waiting time for all operations. Waiting time increased for hips in two states, cataracts in three and knees in four.

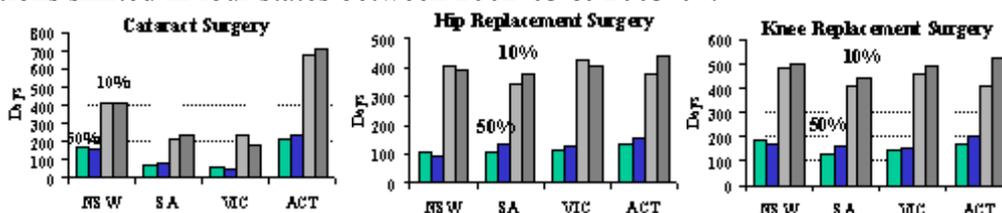


Fig 1 Average waiting times for elective surgery between 2002-03 and 2003-04

The table shows, no state decreased waiting time for both groups and one state, South Australia, increased waiting times for the three surgical procedures.

Percentage surgical waiting time improvement / decline: 2002-03 to 2003-04				
Waiting time group	New South Wales	Victoria	South Australia	Australian Capital Territory
Time 50% waited	-11%	+2%	+25%	+16%
Time 10% waited	+1%	-8%	+9%	-20%

Australian federal and state governments are both responsible for public health. Throwing money at the existing system is not considered to be the answer. Seemingly there are enough surgeons and spare capacity in theatres to meet demand, but insufficient beds. It is suggested that a single level of government would encourage new means of tackling the problem and remove the exchange of blame between the different levels of government.

Analysing waiting lists is just another part of the issue of modelling patient flow. Rather than rhetoric and blame, surely, health care modellers should be providing evidence to help solutions to be found.

C Pirani, *Hospital waiting lists worsen*, The Australian, 21 March 2005, p 1-2.; C Pirani, *Money no cure for health system*, ibid 21 March 2005, p 2.

[The First East European Conference on Health Care Modelling and Computation \(HCMC 2005\)](#)

Craiova, Romania: 31 August to 2nd of September 2005.

Conference organisers [Florin Gorunescu](#) and [Elia ElDarzi](#)

Original research and application papers in English reporting recent developments relating to the engineering and practical management of health care systems are welcome **Paper deadline 10th May 2005**



Welfare state to welfare market;

Part 1 How socio-economic decisions created and changed the NHS [Dr Chooi Lee](#), Consultant Physician, Kingston Hospital, Surrey, England and Peter Millard

History is important

In the 15th century monks looked after the chronic sick and poor. After the fall of the monasteries, means testing and residential qualifications were introduced when parishes became responsible for their care. By the 20th Century local government provided hospitals for acute illness, psychiatry and infectious diseases, and institutional care for learning disabilities, chronic illness and older people.

Before the NHS was created, a financial divide separated the rich from the poor. Hospital patients paid according to their means. Many GP's were paid in kind. The two lines (||) on the directional arrows in Figure 1 indicate rate-limiting steps, based on ability to pay and / or resource availability.

Creating the NHS

Figure 2 shows how the NHS legislation changed the financial divide. The inclusion in the 1946 legislation of free care for chronic illness was a unique feature of the NHS that distinguished it from all other countries in the world.

Operational Planning, the NHS and Rehabilitation were by-products of war. Consultant leadership in the diagnosis and rehabilitative management of patient care in the long-stay wards was introduced, because it was hypothesised that this would free thousands of hospital beds for others to use.

Rehabilitation begins in the chronic sick wards

In 1950, 50,000 people were on the chronic sick waiting list. As the consultant led attack on bed rest began, gradually a trickle of discharges became a flood. Figure 3.

All services had to be developed. Pre-admission home assessment, out patient clinics, halfway houses, day hospitals and progressive patient care were introduced. By 1970 Districts without active geriatric services were considered to be disadvantaged.

In 1971 the bed norm for geriatrics was 10 beds per 1000 over 65 years, with 50% in general hospitals. Age related, needs related and integrated admission policies were developed, all had in common slow-stream rehabilitation.

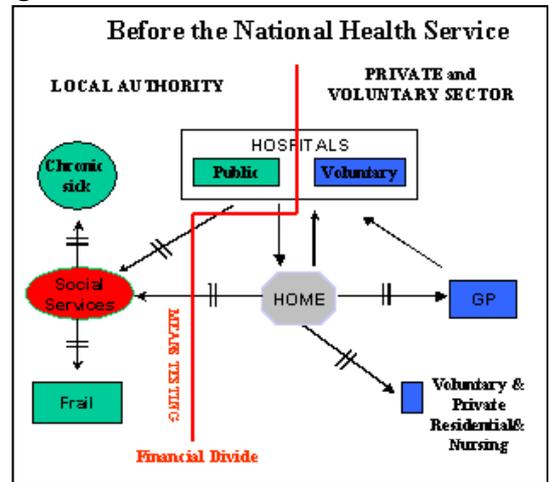


Fig 1. From the 16th Century to 1948 a financial divide separated rich from poor

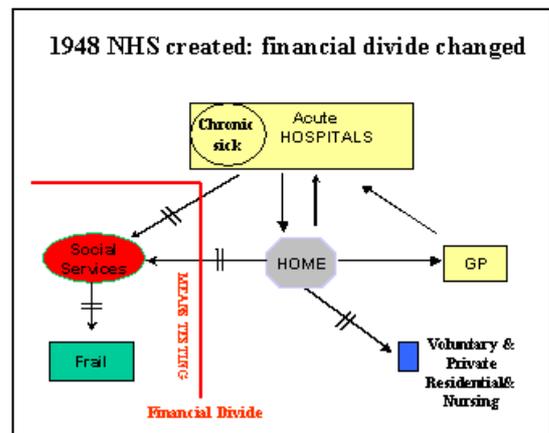


Figure 2 The NHS plan changes the financial divide, so the attack on bed rest can begin..

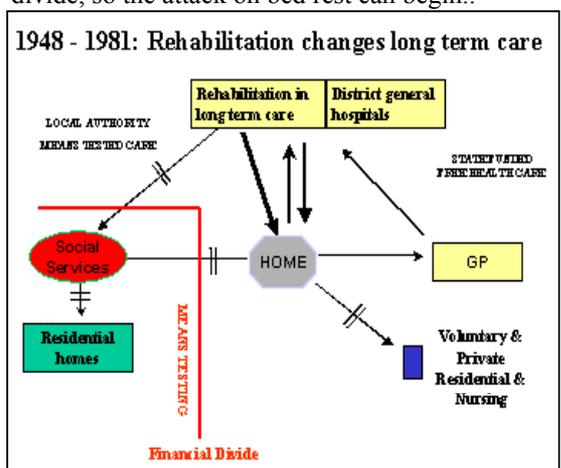


Figure 3. Gradually a trickle of discharges became a flood.

Financial divide opens: all change

During the 1980's and early 1990's, open access to Board and Lodging Allowance in residential and nursing care was allowed, while strict cash limits were imposed on hospital and local authority expenditure (Figure 4). Everyone took advantage. Thousands of extra nursing home and residential beds were opened and beds for geriatric medicine and psycho geriatrics were closed (Figure 5).

Slow-stream rehabilitation and community support was no longer needed. Thousands of older people entered residential and nursing homes without multi-disciplinary assessment. A national audit found that 42% of nursing homes residents admitted from hospitals and 94% from the community did not have a specialist geriatric assessment¹.

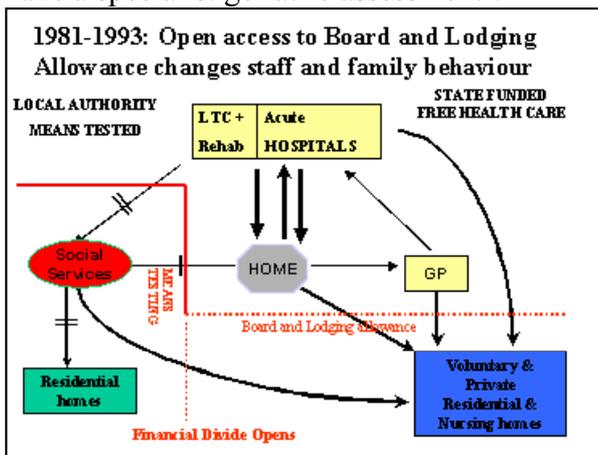


Figure 4. Open access to Board and Lodging Allowance changes staff and family behaviour

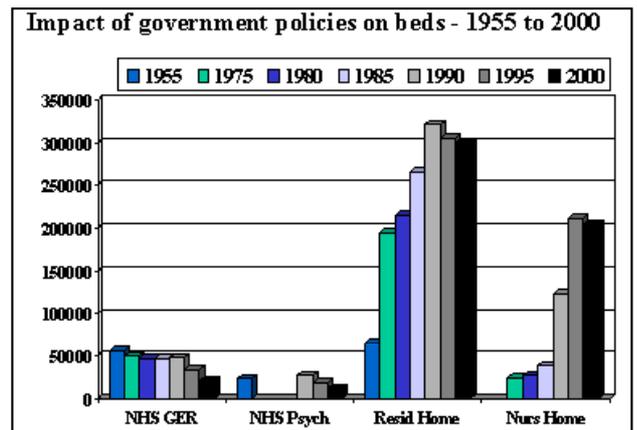


Figure 5. Impact of government policies on bed numbers in the NHS and in residential and nursing homes: 1955 -2000.

Shutting the door

Government expenditure was out of control: £8 million in 1980, £2.4 billion in 1990. On April 1st 1993 open access to public funds for residential and nursing home care ceased and means testing by local authorities returned, this time as purchasers not providers of nursing care (Figure 6).

At first, the impact of the change was masked, because Social Service departments were given transition grants to purchase care. However as the hospital bed crises returned, in 1995 government rediscovered rehabilitation (HSG 95/8).

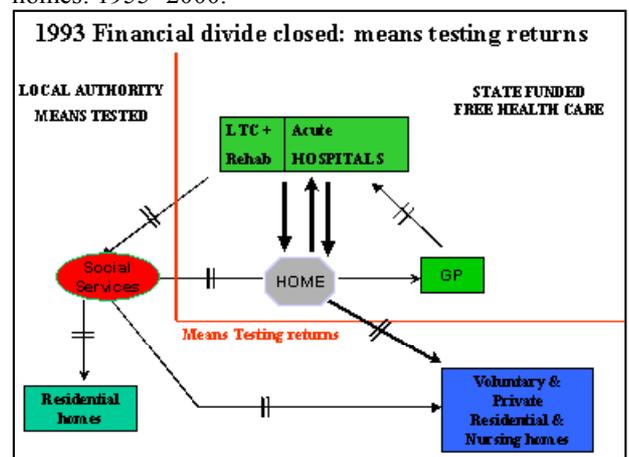


Figure 6. Means testing returns: 16th C controls return.

Conclusion of Part One.

When changes in parts of the health and social care system are proposed, the immediate and long-term effect on the total system of care should be modelled. The NHS experience teaches that changes made outside acute hospitals can have beneficial or adverse impact on acute hospital care. Furthermore, it shows that comprehensive services to meet the needs of dependent and vulnerable people are not required, if uncontrolled access is given to publicly funded long-term care.

Part 2, introduces the biochemistry of care, considers the special needs of vulnerable older people and concludes that a new service 'xyz' should arise from the ashes of the past.

Victor, C., I. R. Hastie, et al. (2001). "The inappropriate placement of older people in nursing homes in England and Wales: a national audit." *Quality in Ageing - Policy, Practice and Research* 2(1): 16-25.

Straightforward discharges are like axial flow

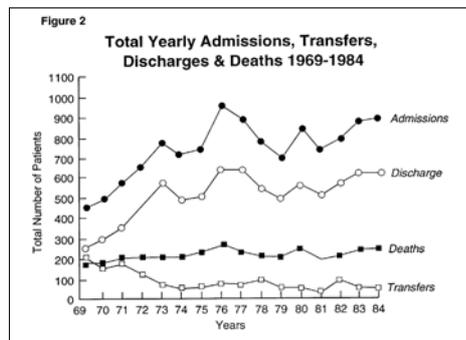
The discussion continues: Carl Long writes: Time must come in to the equation since we are considering 'flows'. I had a funny thought walking past a stream with my little boy. Straightforward discharges are like axial flow - nice and smooth as in the centre stream. Out in the peripheries 'eddy currents' occur and things like branches get stuck. In essence patients 'out of the centre' i.e. those who don't fit the 'discharge as soon as possible mould' get stuck. What do you think? Maybe flow mechanics would help unblock the system

Editor replies. Axial river flow, an interesting thought. It reminded me of my youth hiring out skiffs on the river Arun. The Arun is the second fastest river in England; the tidal drop is 16 feet. Rowing with the tide is simple; rowing against it requires local knowledge and skill. The secret is to take advantage of the reverse flow, tuck into the sides in the straights and to cross at the bends to the short side. Easy if you know how.

Sometimes people need a helping hand. This is where policies based on guidelines and patient choice fall short. Medicine is both an art and a science. Although we told the tourists what to do, coming back with the tide many missed the landing stage and went through the bridge. So we had to row them back.



'Stuck branches' brings back memories of my early years at St. George's hospital, when we changed a geriatric medical service with a waiting list of 68 into a no waiting list service by creating therapeutic environments. Given appropriate care, time to regain fitness, optimistic staff and supportive after care many 'bed-blockers' returned home. The picture illustrating the basic principles of stroke patient nursing care was shot in 1973.

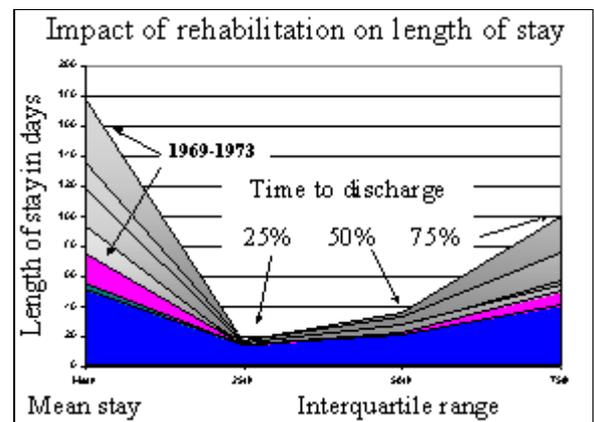


The figure shows how the annual admissions, discharges, transfers and deaths changed between 1969 and 1984. Seeing the decline in admissions after 1977, I thought that staff had gained a skill and then lost it. A new consultant had joined in 1974 and another in 1979. Maybe they were not as skilful as I. Paranoia.

However the percentile distribution did not support that conclusion. The numerical values of the figure below are on page 1 of the [August 2004 issue](#) .

Clearly, between 1969 and 1973 the 75th and 50th percentiles of length of stay changed. However, between 1974 and 1984 they remain relatively constant, so changing staff discharge behaviour could not explain the decrease in admissions that occurred after 1977. Eventually we realised that a decision to change the use of 12 beds from admission to long-stay collapsed the service.

It's all a question of time. Given the average stay in acute beds is 28 days, change of use of 12 beds from acute care to long-stay will cause annual admissions to decrease by 156 (13 x 12) i.e. when $A_c > L_v$ then the ability to admit decreases.



Taking your analogy of axial flow, the system collapsed because more branches got stuck on the banks.

Meeting Health Challenges with OR: Special issue of JORS February 2005.

Edited by Ruth Davies and David Bensley, the special issue of JORS contains eleven papers describing practical applications of OR techniques. Two of the articles have figures that make important points. As a picture saves a thousand words I had hoped to feature them here. However, despite the permission of the authors, the publishers wanted £110. So words.

“Modelling the requirements for supplementary nurses in an intensive care unit”, Griffiths JD et al JORS 2005 (56) 126-133 contains a figure that explains why, given the high cost of supplementary nurses, it is more often than not more cost efficient to have spare rostered nurses than to employ at times of crises agency staff. Surprising but true.

“A simulation-based study of a NHS Walk-in Centre”, Ashton R et al. JORS 2005 (56) 153-161 contains a figure which supports a hunch I have always had. Using a simulation model and actual data, their research shows that policies based on nurse triage can, at busy times, increase waiting time. At busy times, given one nurse triaging and four nurses seeing patients, waiting time is less if all nurses see patients.

Other papers concern: geographical simulation of resource allocation for oral and maxillary surgery; a framework for predicting gross institutional cost of long term care for older people; developing an integrated musculo-skeletal service; evaluation of health information systems, a systems vision of knowledge management in emergency care; improving community care and assessment of risk of CJD transmission via surgery community. All told a feast of articles worth exploring..

Believe it or not, frequent Accident and Emergency attendees are sick

A retrospective, cross-sectional study of clinical and financial records in an emergency department Washington tertiary referral hospital concluded that the vast majority of people who attended two to 20 times in one year have serious illnesses. The authors conclude, policy makers must take into account the heterogeneity of needs in this group to ensure made for one group do not negatively affect others.

Ruger, J. P., C. J. Richter, et al. (2004). "Analysis of Costs, Length of Stay, and Utilization of Emergency Department Services by Frequent Users: Implications for Health Policy." *Academic Emergency Medicine* 11(12): 1311-1317.

How many empty beds does a hospital need: 100% occupancy is an impossible dream.

The mysteries of queuing theory, the flawed logic behind closing 'empty' hospital beds and the mathematics of queues are revealed. 100% bed occupancy: sheer nonsense. Below 80-85% occupancy too many; 65-75% spendthrift; 80 to 90% well controlled steady state 'plant capacity. In a heterogeneous system 100% occupancy is an impossible dream.

McQuarrie, D. G. (1983). "Hospitalization utilization levels. The application of queuing theory to a controversial medical economic problem." *Minnesota Medicine* 66(11): 679-86. Donald McQuarrie in *Minnesota Medical* 1983; 66:679-86.

Confidence about confidence intervals: how confident are you?

How confident are you about the meaning of statistical results in clinical trials? A 2001 Lancet paper enlightened me. It explains why p values and confidence intervals can mislead and recommends that clinical significance curves and risk-benefit contours be used instead, illustrating their use in survival studies in cancer treatment.

Shakespeare, T. P., V. J. Gebski, et al. (2001). "Improving interpretation of clinical studies by use of confidence levels, clinical significance curves, and risk-benefit contours." *Lancet* 357(9265): 1349-53.

Responding to the challenge of chronic disease in Europe: where to and why

The needs of the ageing population and improved survival with chronic illnesses challenge the very nature of medicine.. Seven influencing factors provide opportunities and challenges

1. **Growing opportunities for early intervention.**
2. **The balance between hospitals and alternative settings of care is changing.**
3. **The professional and patient involvement in care is changing.**
4. **The balance between evidence and intuition in the clinical encounter is changing.**
5. **Some services simply respond to demand whereas others proactively seek need.**
6. **There is unrealised potential of information technology.**
7. **There is the challenge of developing a workforce to respond to the changing health care environment.**

The nature of these challenges and the weak evidence that informs clinical and policy responses is discussed. Innovations in different parts of Europe described include: nurse-led clinics; mechanisms to bridge health and social care; disease management programmes in Germany and national service frameworks in England. Finally it discusses how to overcome the barriers to change and the scope for learning from international experience.

McKee, M. and E. Nolte (2004). "Responding to the challenge of chronic diseases: ideas from Europe." *Clinical Medicine* 4(4): 336-42.

Christos Vasilakis

Dr. Christos Vasilakis recently joined the SIMCARE research program as a post-doctoral fellow. SIMCARE is supported by a strategic initiative grant from the Canadian Institutes for Health Research, is the brainchild of [Dr. Boris Sobolev](#) and [Dr. Adrian Levy](#), both with the Department of Health Care and Epidemiology, University of British Columbia, Vancouver, Canada. Dr. Sobolev is a biostatistician with formal training and expertise in applied statistics and mathematical modeling. Dr. Levy is a health services researcher with formal training in epidemiology and expertise in cardiovascular disease treatment. They are the principal investigators of this project that is being built upon research capacity developed with funds from several competitive grants. Christos is further supported by the British Columbia (BC) [Michael Smith Foundation for Health Research](#) through a fellowship.

Forthcoming conferences: also see <http://www2.wmin.ac.uk/coiec/nosokinetics.htm>

25th Applied Statistics in Ireland Conference, Enniskillen, 18th-20th May 2005.

Abstracts due 31st March 2005. Contact [Adele Marshall](#)

IFORS Hawaii? July 11-15, 2005: [Website](#)

31st Annual Meeting of the EURO Working Group on OR Applied to Health Services (ORAHS) 31 July - 5 August, 2005. Location: University of Southampton

Contact: [Sally Brailsford](#) Website: www.management.soton.ac.uk/orahs . Held in parallel with a EURO Summer Institute on OR in Healthcare, see www.management.soton.ac.uk/esj.

OR Society Conference, University College Chester, 13th - 15th September 2005.

Papers would be most welcome for the Health Stream. Please send titles and abstracts to either Chris Sherlaw-Johnson (c.sherlaw-johnson@ucl.ac.uk) or Gillian Mould (g.i.mould@stir.ac.uk)

Thank you for your continued support. Please circulate to others who you think may be interested. In the June issue, Steve Gallivan considers the relevance of Braes Paradox to health care planners.

Editor: [Prof Peter H Millard](#) For earlier editions <http://www2.wmin.ac.uk/coiec/nosokinetics.htm>