

Why are we waiting?

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Redesigning Healthcare Summit
Adelaide
Tues 28th March 2006
1130 – 12.30

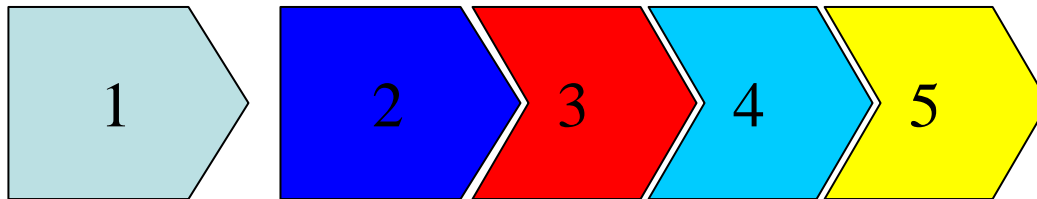
With thanks to

- **Richard Steyn** MS FRCSEd(C-Th)FIMCRCSEd MRCGP,
Consultant Thoracic Surgeon, Heart of England NHS
Trust, Birmingham UK
- **Richard Lendon** MBChB FRACGP,
General Practitioner Lincoln, UK
- And a cast of thousands in UK National Health Service

www.steyn.org.uk

Running the UK National Health Service NHS

Computer Model Demonstration



Go to www.steyn.org.uk/models

You can't use these models for real life data

Result for NHS?

For patients

- delays
- deteriorating clinical condition
 - physical & psychological

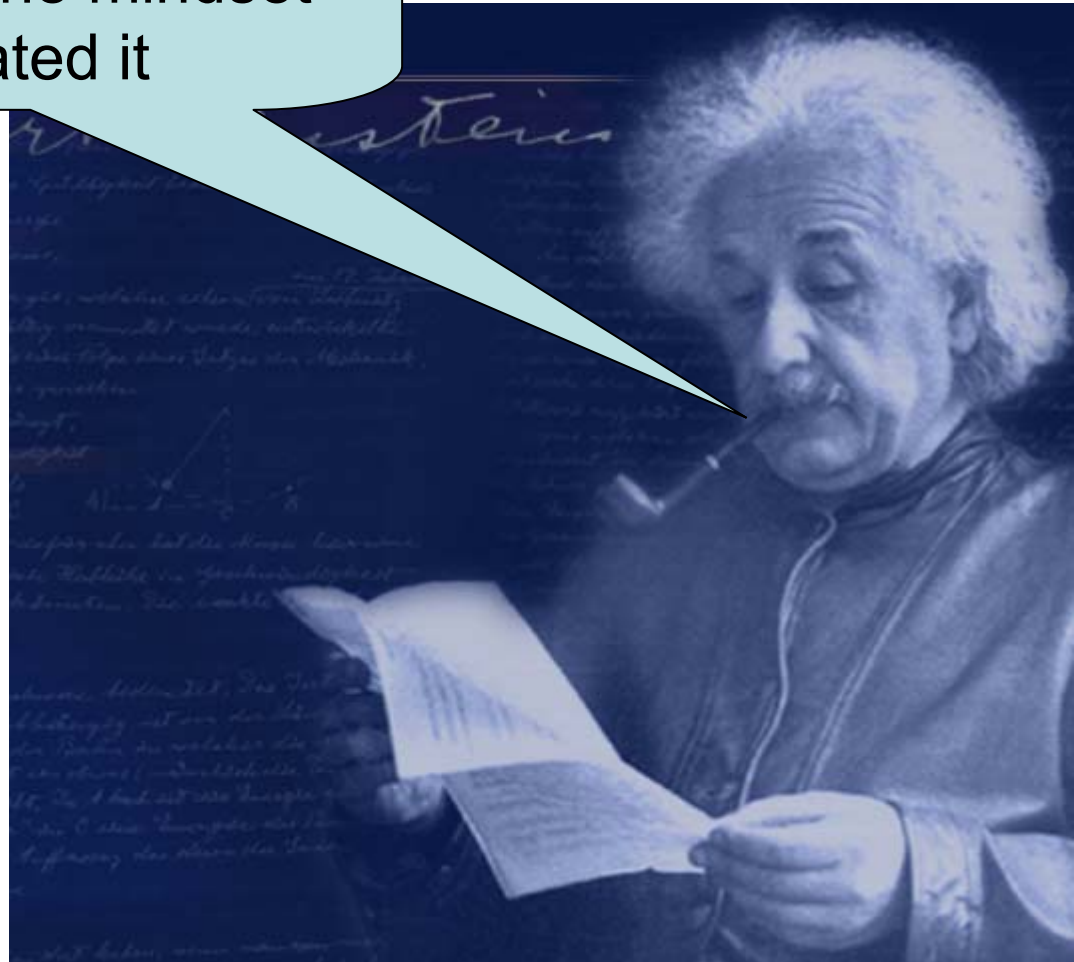
For staff:

- Chaos
- Cost:
 - £47 billion to £98 Billion = 3% increase in activity
(The Economist July 04)
 - Economic growth forecast for UK reduced due to NHS cost
(The Economist Oct 05)

Now what?

- 2005 - 06
 - **‘Massive’** cost cutting initiative
 - Forecast March 06 > £800 Million deficit
 - 2.5% Cost efficiency across the board
 - Plan to deliver through IT (!)
 - **Huge** organisation reorganisation (again)
 - ‘life’ expectancy of CEO = <14 months
 - March 06: Sir Nigel Crisp CEO NHS ‘resigns’
 - (to become Lord Crisp)

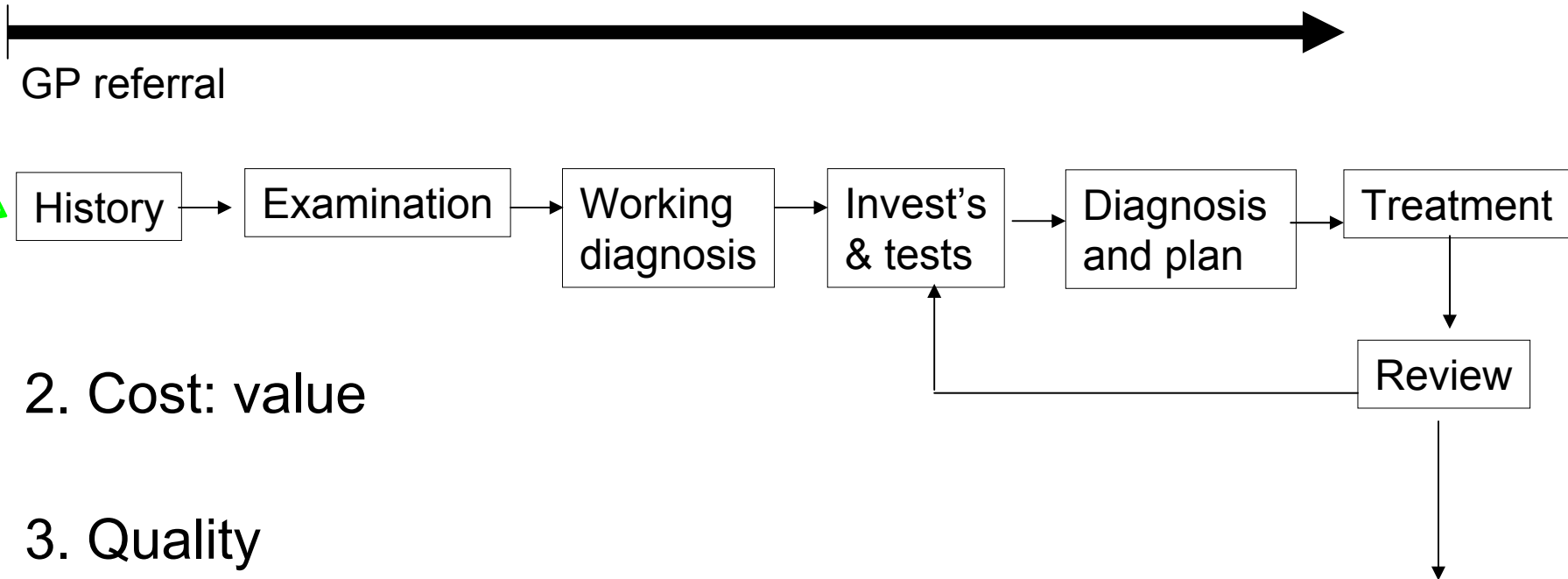
You will never solve the
problem with the mindset
that created it



Albert Einstein

Process view:

1. Time



2. Cost: value

3. Quality

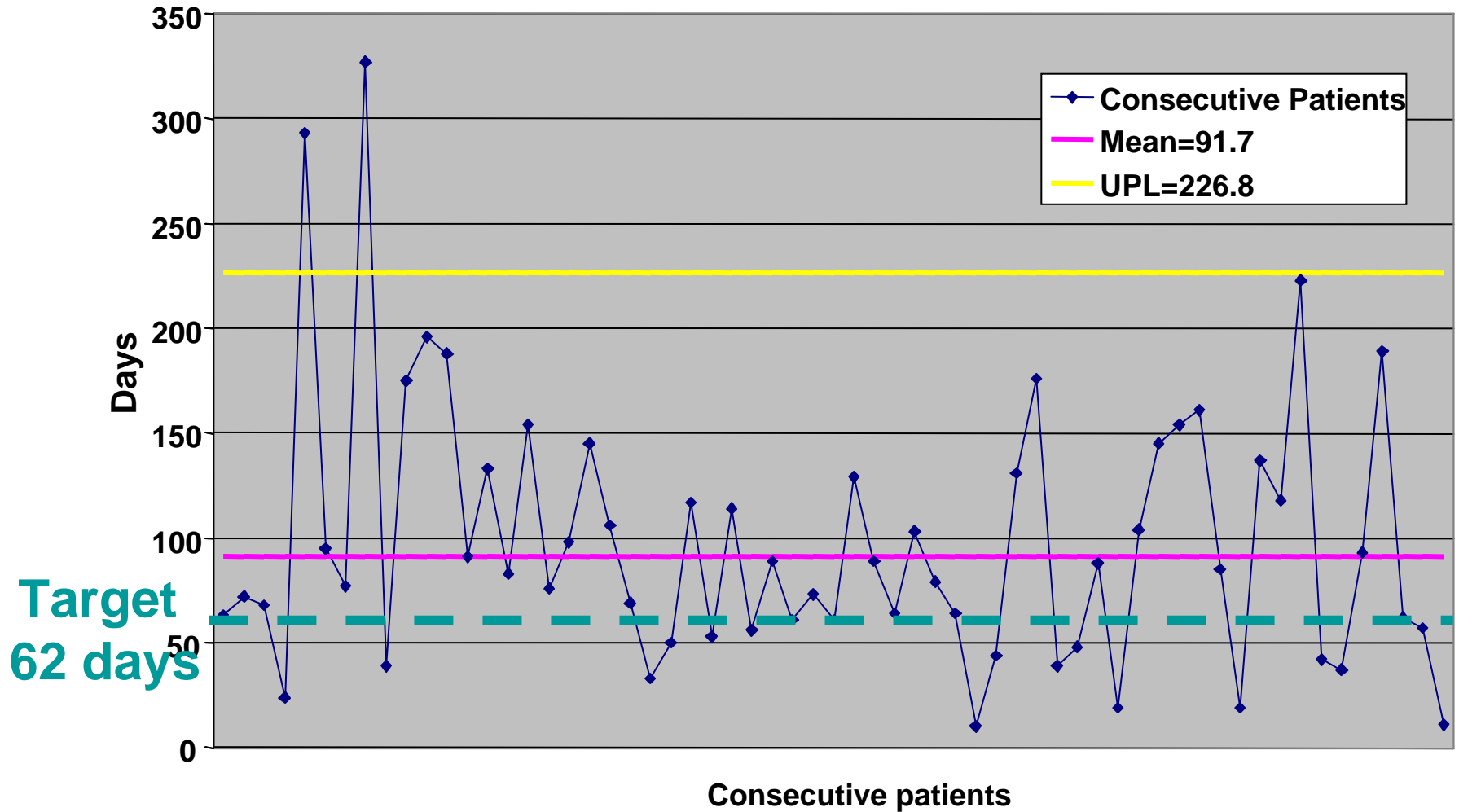
- service experience
- clinical outcomes
- staff experience

Discharge (or death)

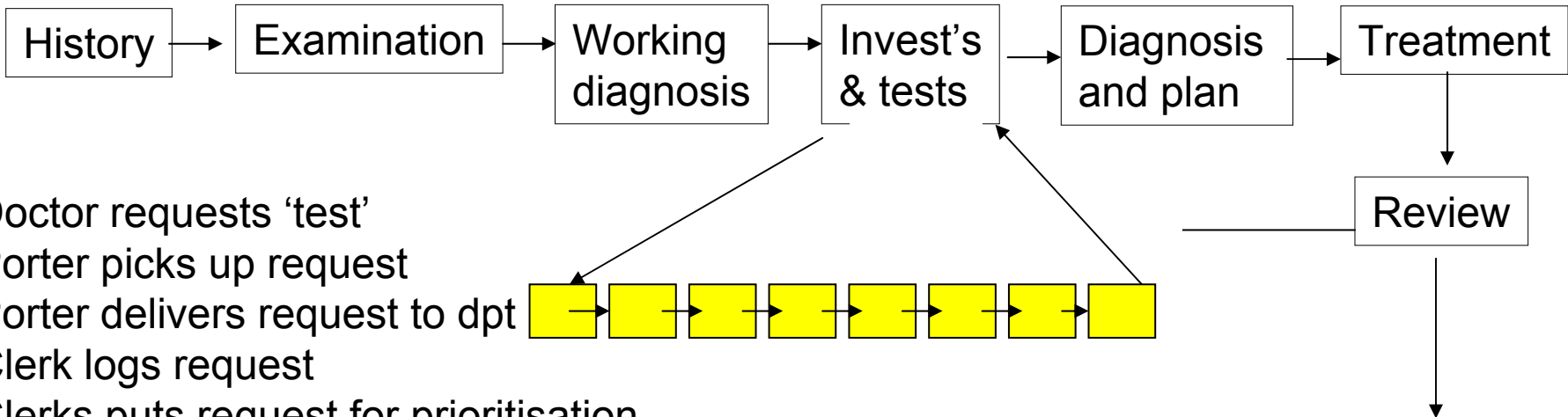


GP to Surgery for Colorectal Cancer

Urgent referrals



Process View:



- Doctor requests 'test'
- Porter picks up request
- Porter delivers request to dpt
- Clerk logs request
- Clerks puts request for prioritisation
- Consultant for prioritises request
- Consultant returns request
- Clerk files request in priority order
- Clerk draws request from file
- Clerk makes appointment
- Clerk sends appointment by post (>6 steps)
- Patient receives appointment
- Patient travels to hospital
- Patient finds car parking slot
- Patient finds X-ray department
- Patient checks in at reception
- etc



Discharge (or death)



Value?
Waste!

Impact on Quality

Probability of Performing Perfectly

No. process steps	Probability of Success, Each Process Step			
	0.95 	0.990	0.999	0.999999
1	0.95	0.990	0.999	0.99999
25 	0.28	0.78	0.98	0.998
50	0.08	0.61	0.95	0.995
100	0.006	0.37	0.90	0.99

Improve the quality of each step

Remove the steps....

Carol Haraden IHI

Issues so far:

A. Too many steps

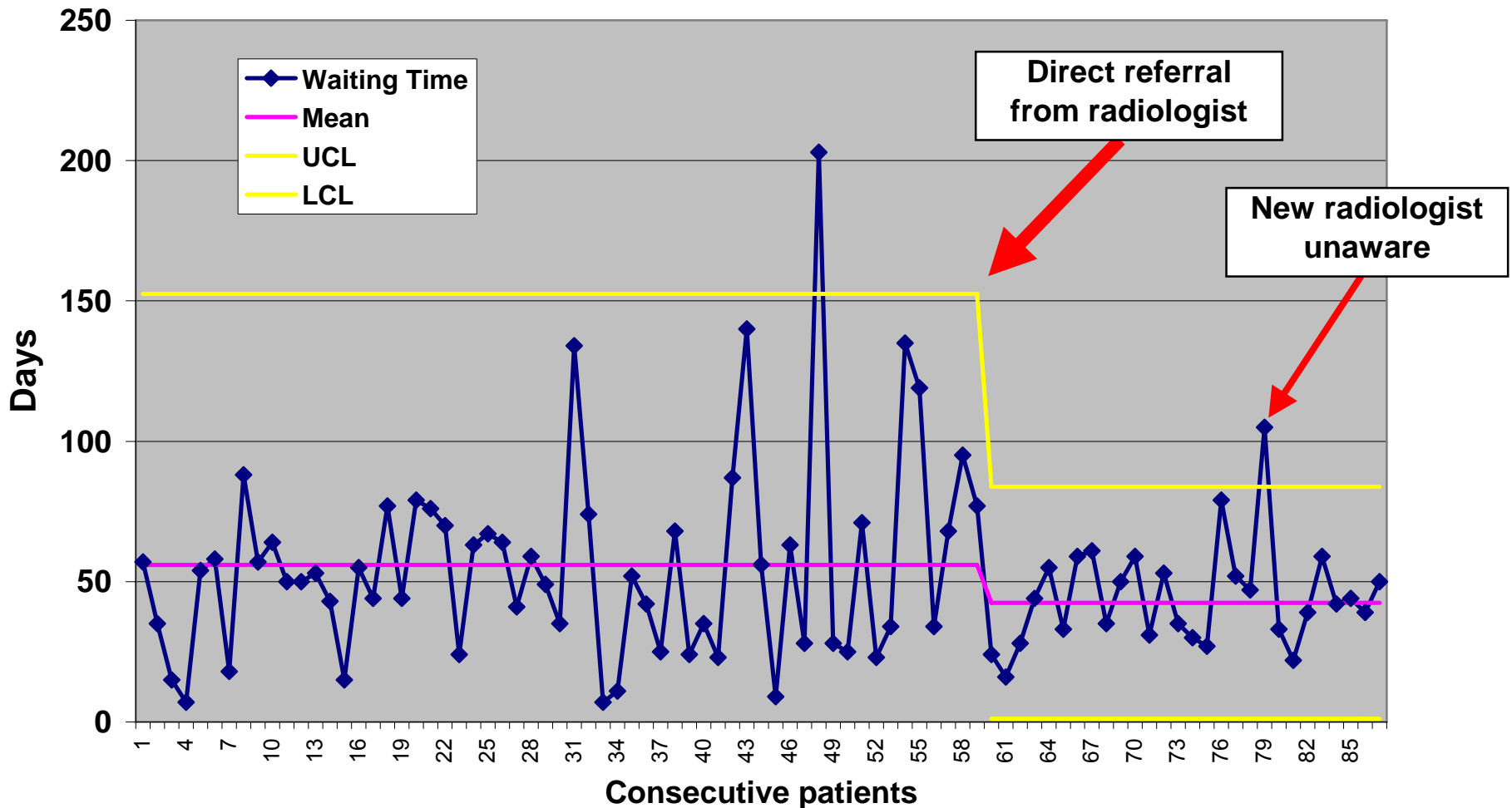
A. impact on quality

B. The queue / waiting list

A. why do we get queues?

A. Removing steps

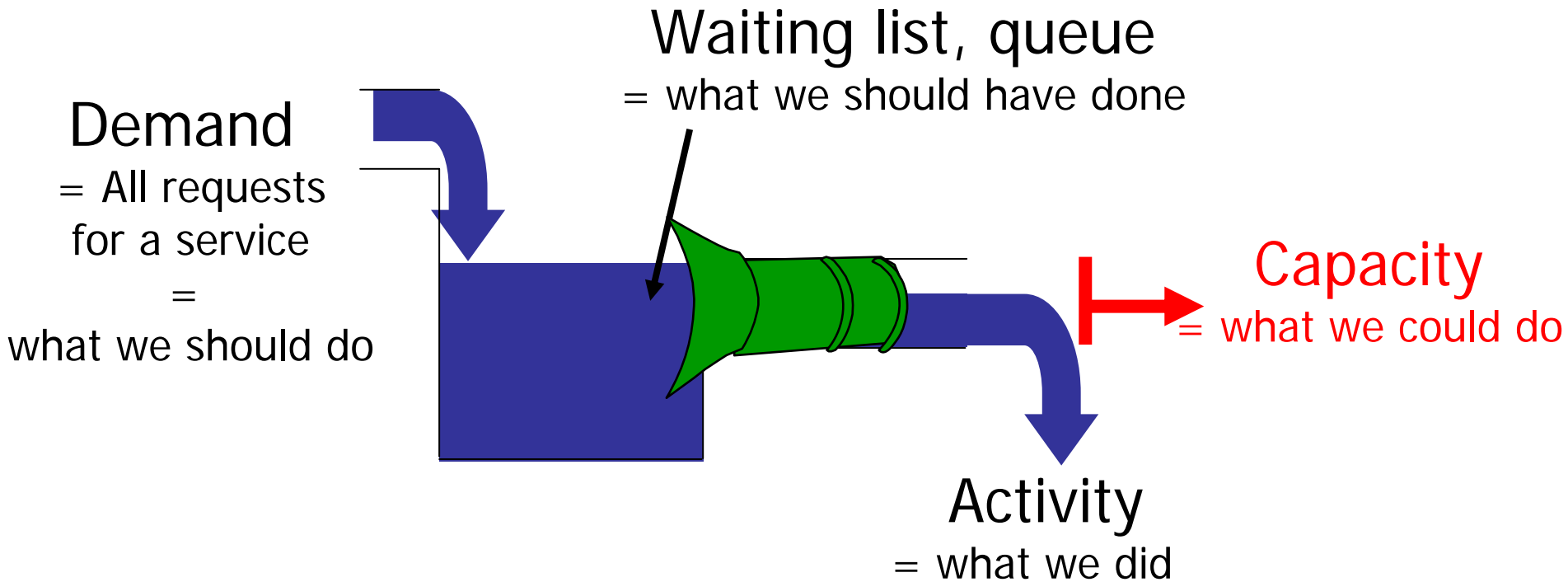
Referral to 1st Treatment - Lung Cancer patients



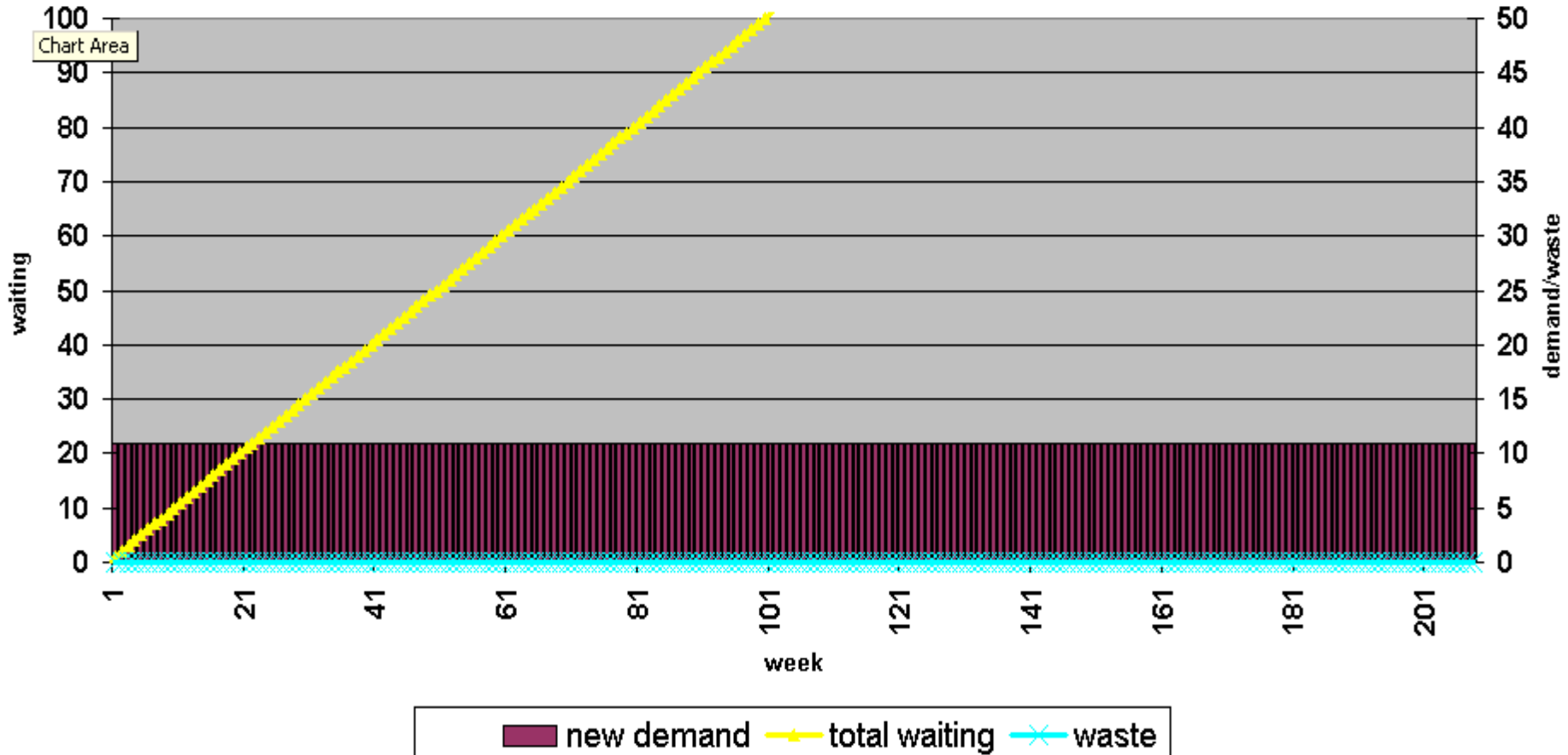
B. Why do we get queues?

1. Demand $>$ capacity?
2. Variation in demand + variation in capacity = queue?
3. Queue to keep utilisation high?

Demand and capacity definitions



1. Demand > capacity



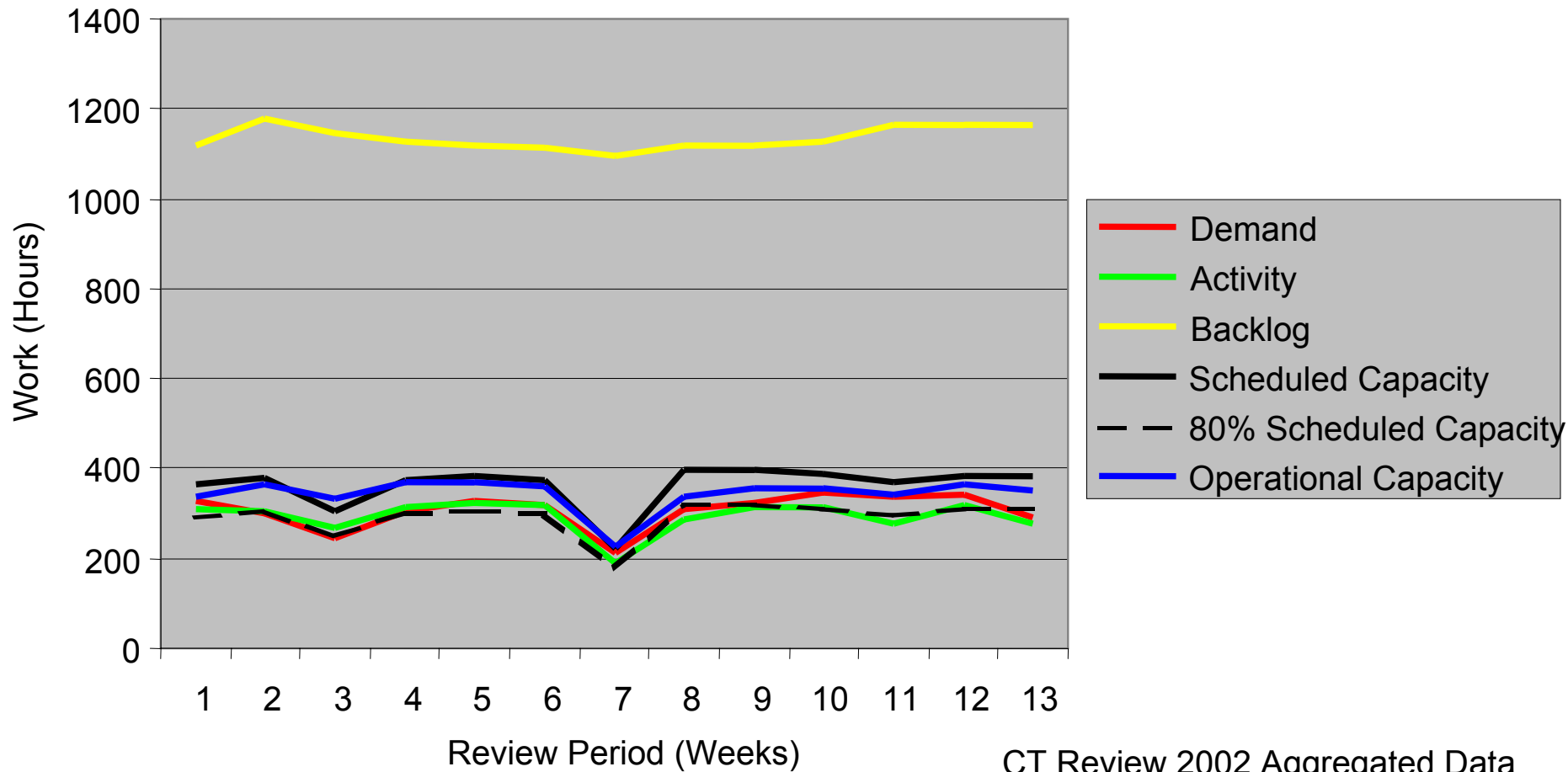
For model go to [www.steyn.org.uk/models/demand analysis.xls](http://www.steyn.org.uk/models/demand%20analysis.xls)

But most queues in equilibrium

Total Waiting List Numbers

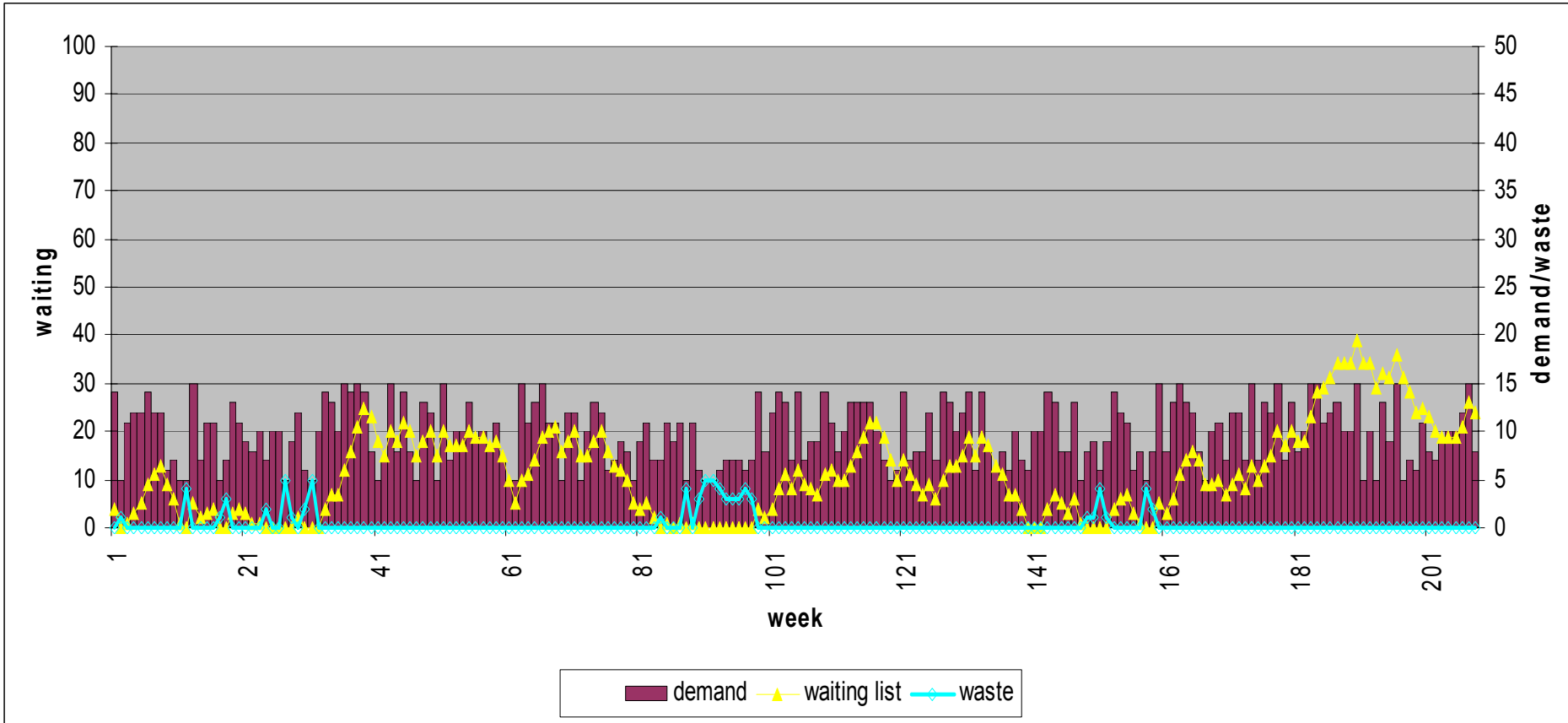


Demand and capacity - CT



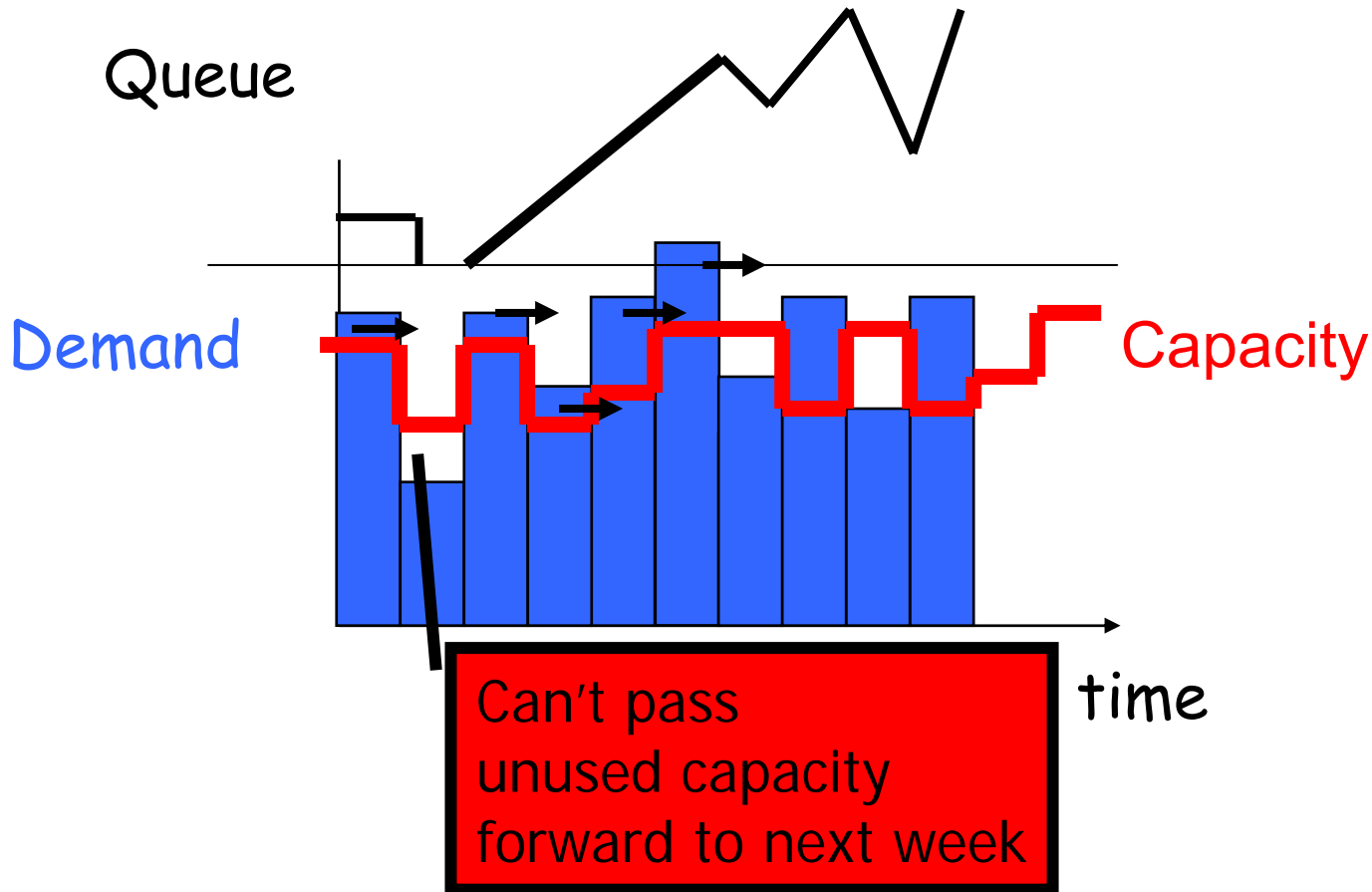
CT Review 2002 Aggregated Data

2. Variation mismatch

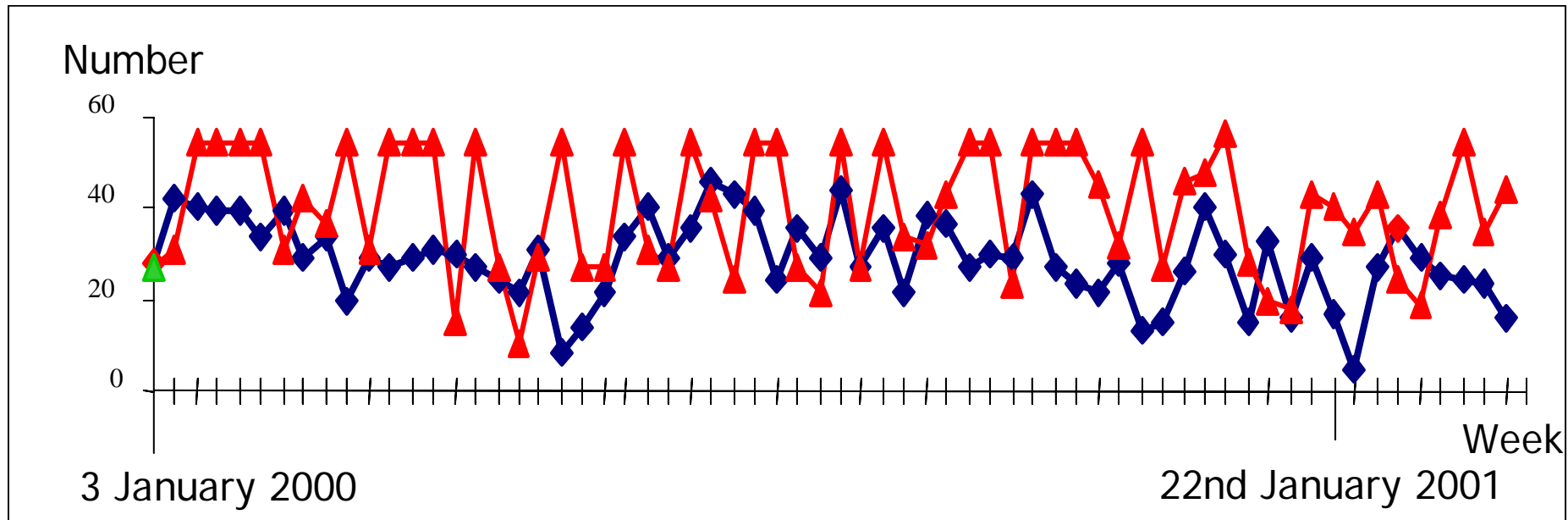


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If av. Demand = av. Capacity,
variation mismatch = queue



Demand & capacity for breast clinic



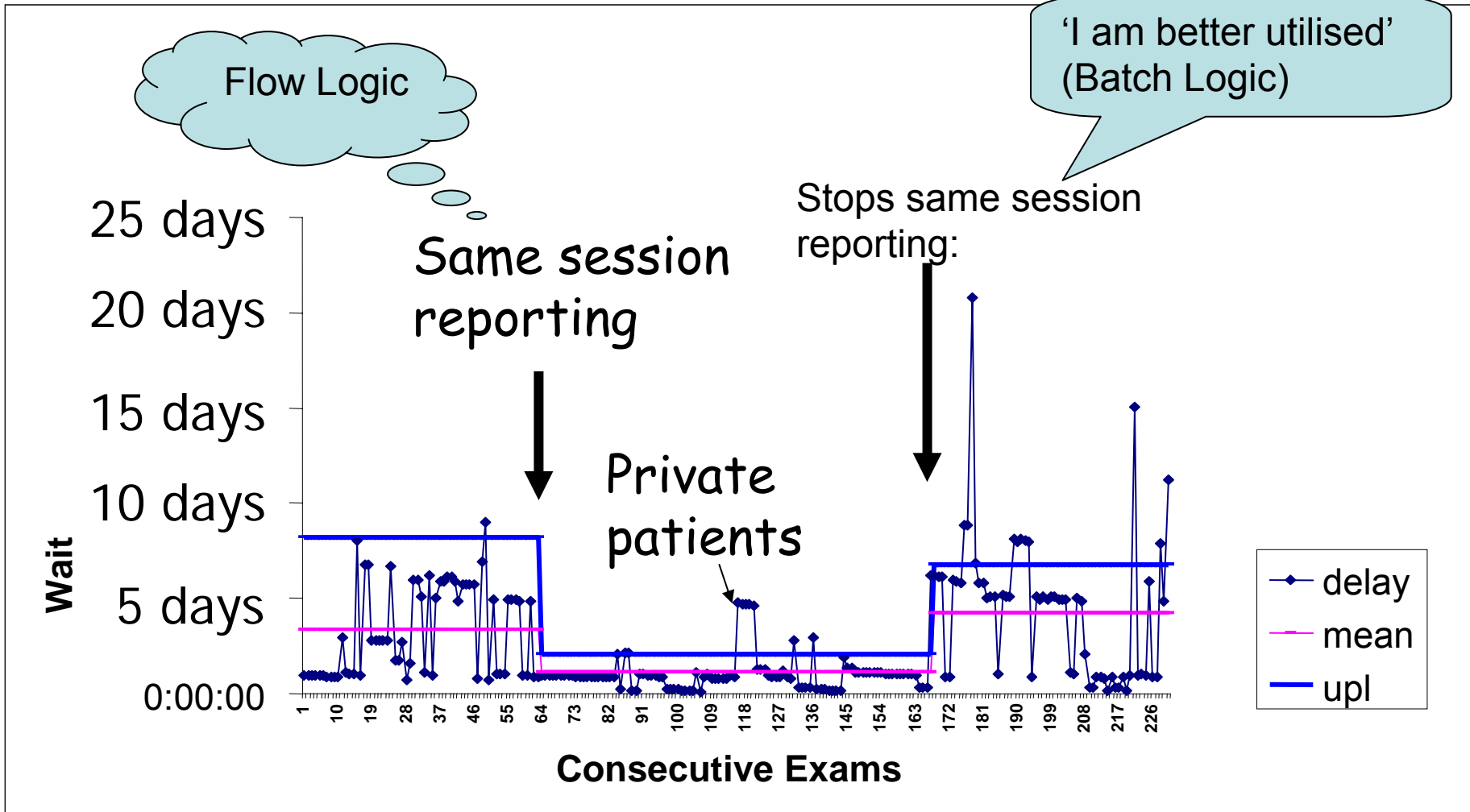
- ◆ Total number of patients referred
- ▲ Number of clinic slots available

3. Queue to keep utilisation high?

- Batch logic

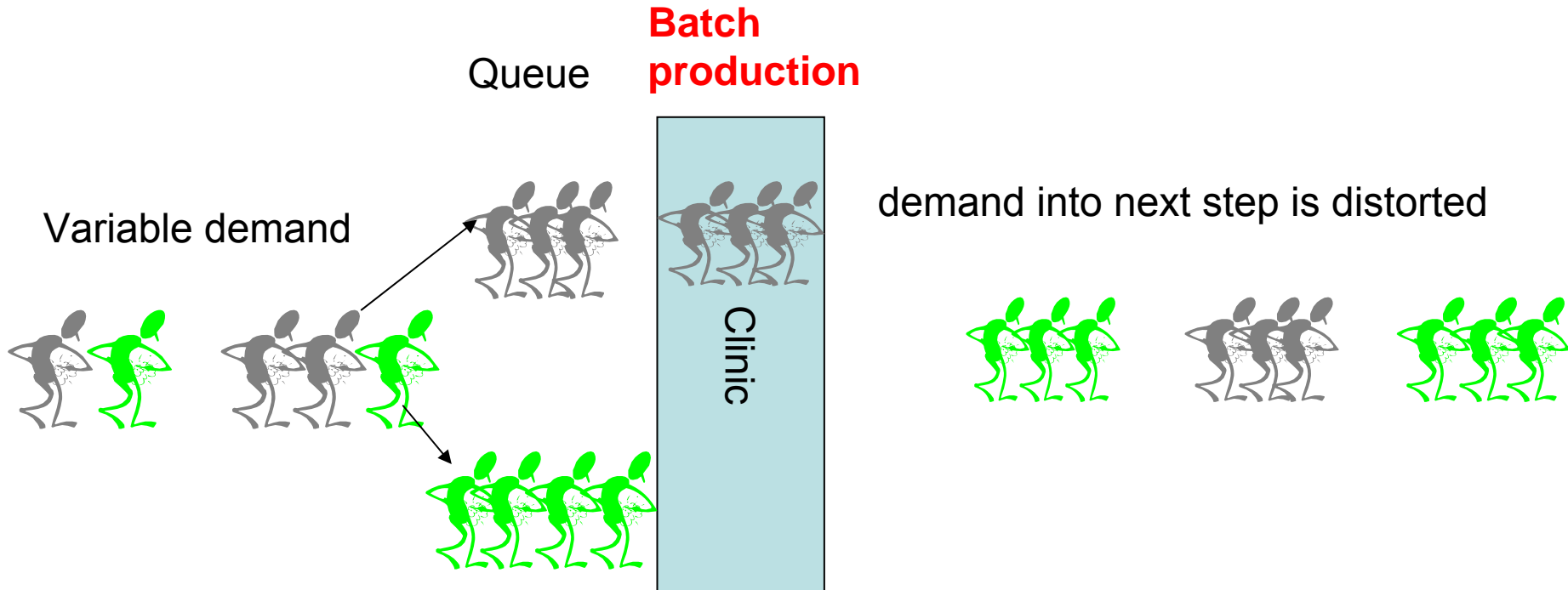
SPC Control Chart

Wait- between CT Exam time and CT Report printed



Impact on total process cost = 5 days @ £125/day x 10% of 195 admissions = £12,000 per week

Batch logic: 'Keep activity high & unit cost low'

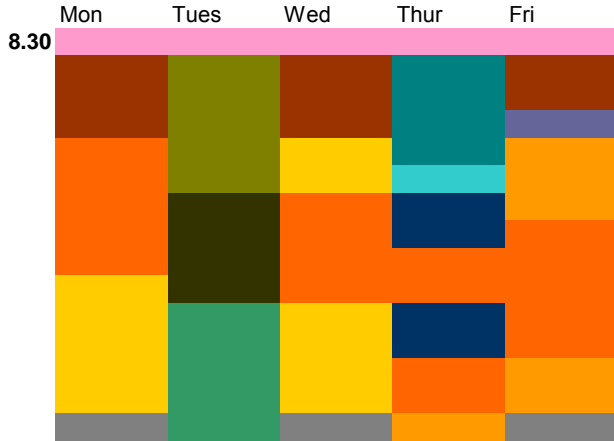


Utilisation of capacity = 100% = unit cost is low = 'clinic is efficient'

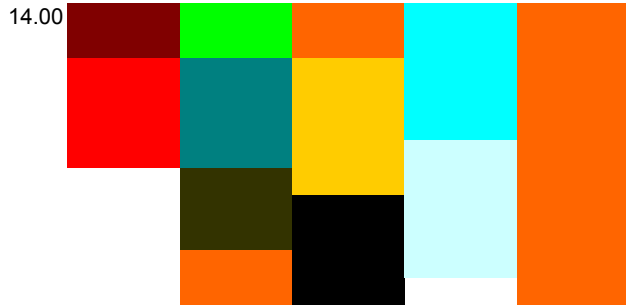
BUT: patients wait
cost of storing queue?
cost of managing the queue?
cost of deterioration in the queue?
cost of downstream capacity?

CT Carve out

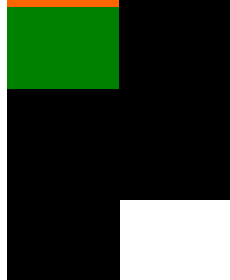
CT A



Lunch



18.00



CT B



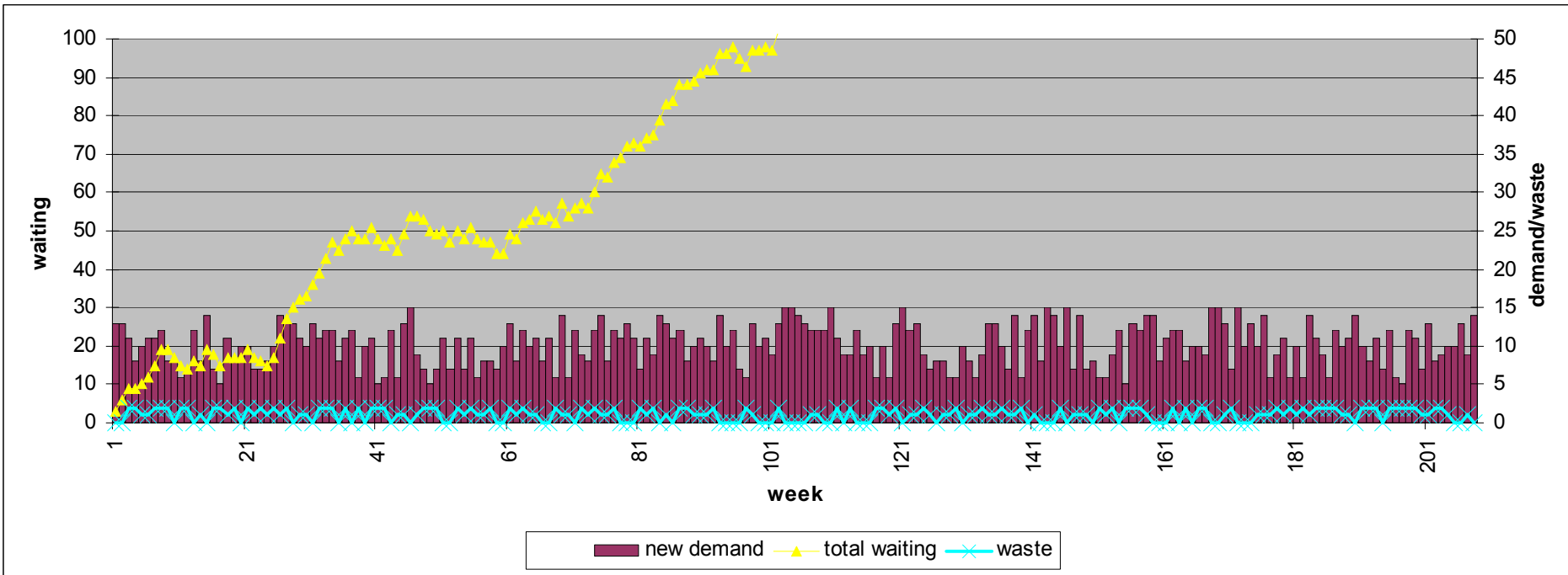
- IP - CTA
- OP -Urgent -Any body part
- IP- Any body part
- OP - Oncology
- OP - Brain - Contrast
- OP - Brain - NC ? Ambulance
- IP-Vascular
- OP - Vascular
- IP - Orthop
- OP- Orthop
- IP- CTPA
- OP - Chest
- HRCT
- OP - Brain, sinus - No Contrast
- OP - Urgent Chest
- Biopsy
- OP- UGI
- IP - Body only
- Lunch
- OP - Urgent Gynae
- OP - Abdo
- Radiotherapy
- IP- Brain
- Chemo

Waste is massive:
 Huge queues for everything!
 Rescheduling
 Wasted sessions and slots
 Waiting for radiologists....

How we traditionally manage queues

- delay
- forced booking
- waiting list initiative
- carved out capacity (or ring fencing), batching for selected groups
 - fixed session working
 - urgency
 - 2 week wait policy
 - condition
 - specialisation
 - technology, sex, age
 -

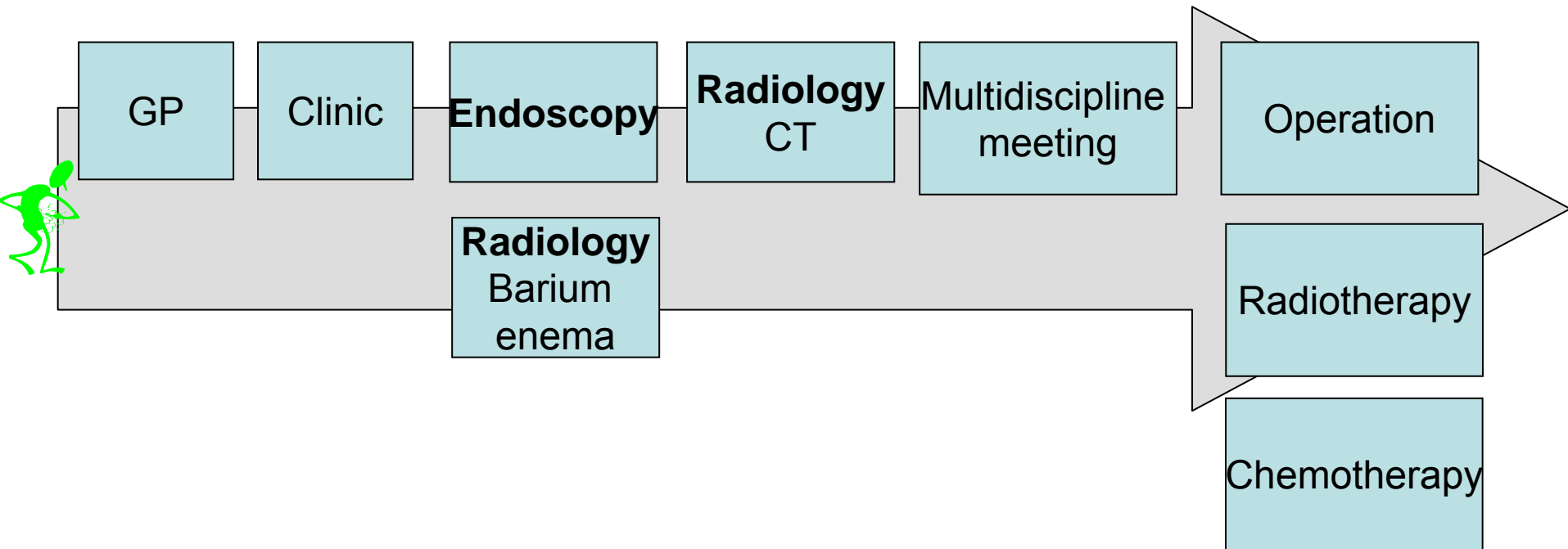
3. Carve-out



For model continue with [www.steyn.org.uk/models/demand analysis.xls](http://www.steyn.org.uk/models/demand%20analysis.xls)

Exercise

- Count the number of queues for one service in your healthcare system:



The size of the carve out

Surgeon 1
2 3 4
Physician 1
2 3 4 5
Radiologist

Number of specialists

Flexi-sig	urgent	x	x	x	x	x	x	x	x						
	soon	x	x	x	x	x	x	x	x						
	routine	x	x	x	x	x	x	x	x						
Colonoscopy	urgent									x	x				
	soon									x	x				
	routine									x	x				
OGD	urgent	x	x	x	x	x	x	x	x						
	soon	x	x	x	x	x	x	x	x						
	routine	x	x	x	x	x	x	x	x						
ERCP															

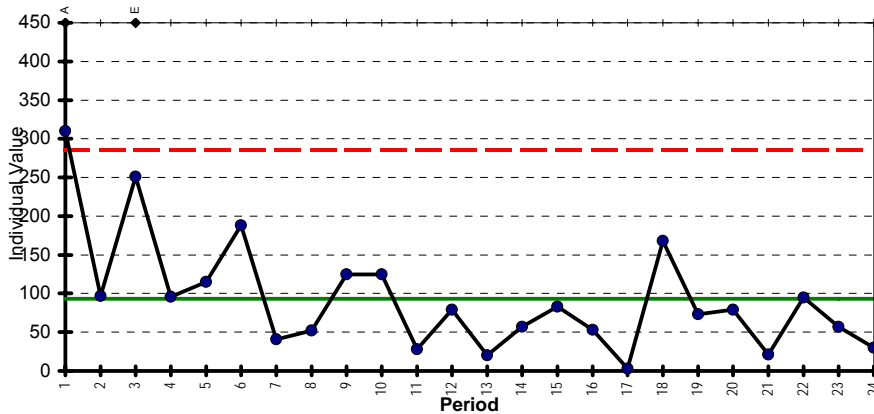
Number of appointment types

73 queues

Bowel cancer

days from receipt of GP referral to surgery

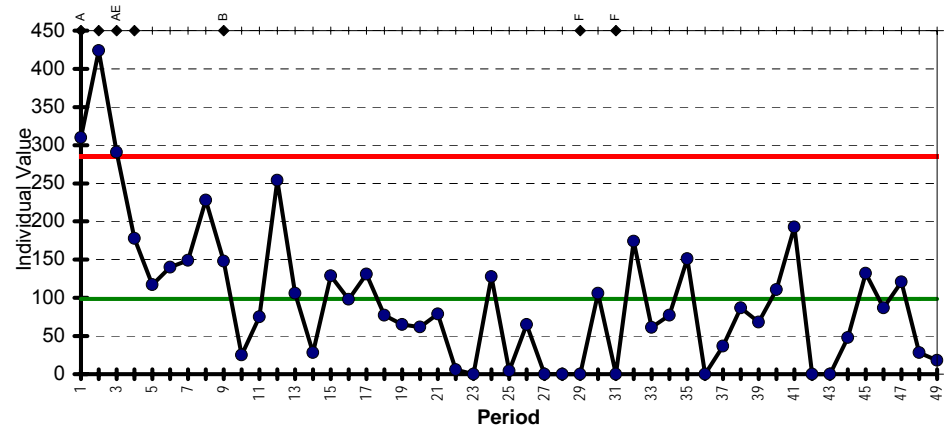
2 week wait



23rd Aug 02

25th Feb 04

not 2 week wait



30th May 02

8th March 04

Comments?

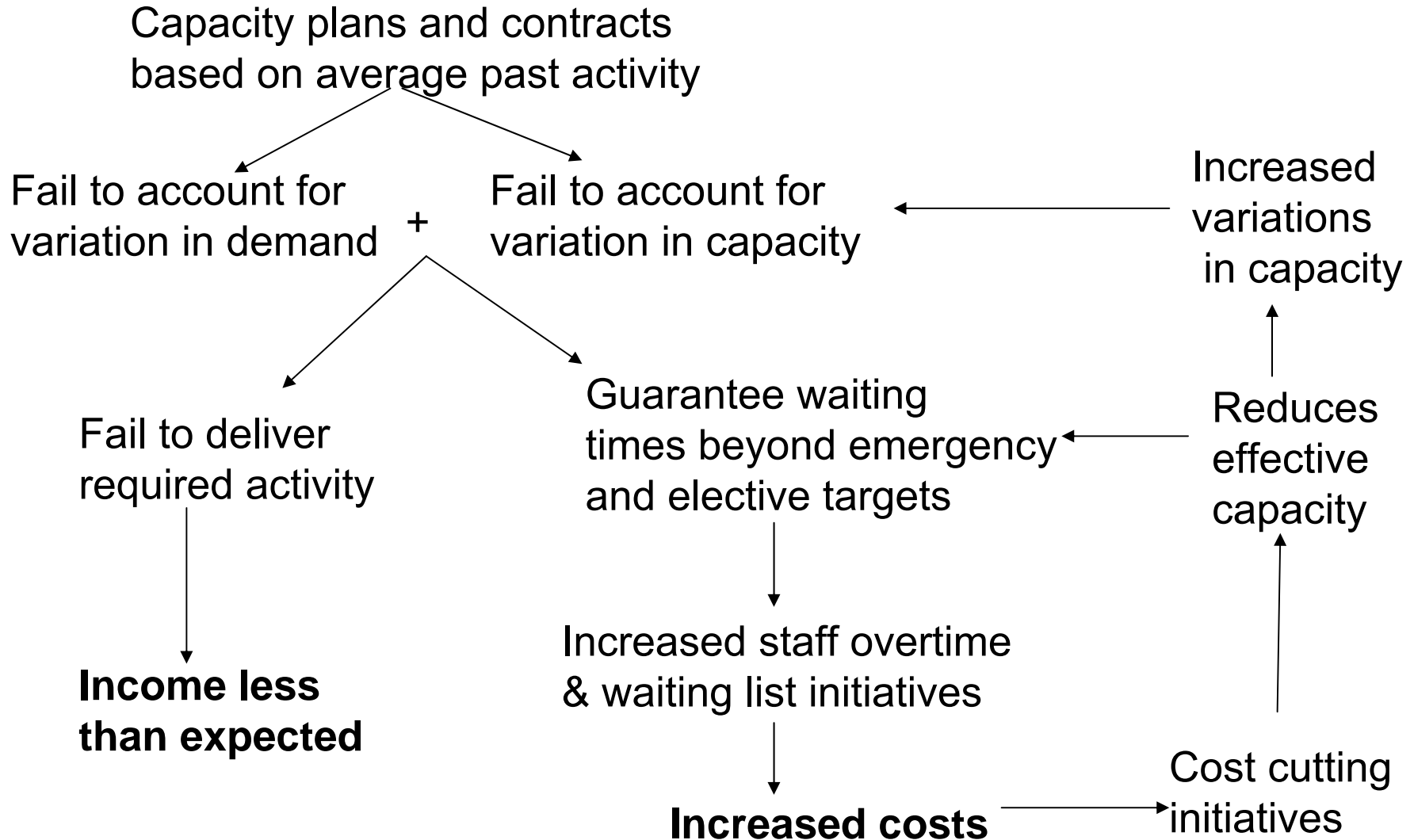
- Any difference between the two systems?
- Both incapable of 62 day target

The dangers of Carving out (ring-fencing, batching)

The queue gets out of hand

- Increases admin costs (no value)
- Increases risk of harming a patient
- Increases risk of losing a patient
- Wastes capacity and resources.
- Waiting list initiatives required
= increased cost, perverse incentives

The road to ruin:



So what should we do instead?

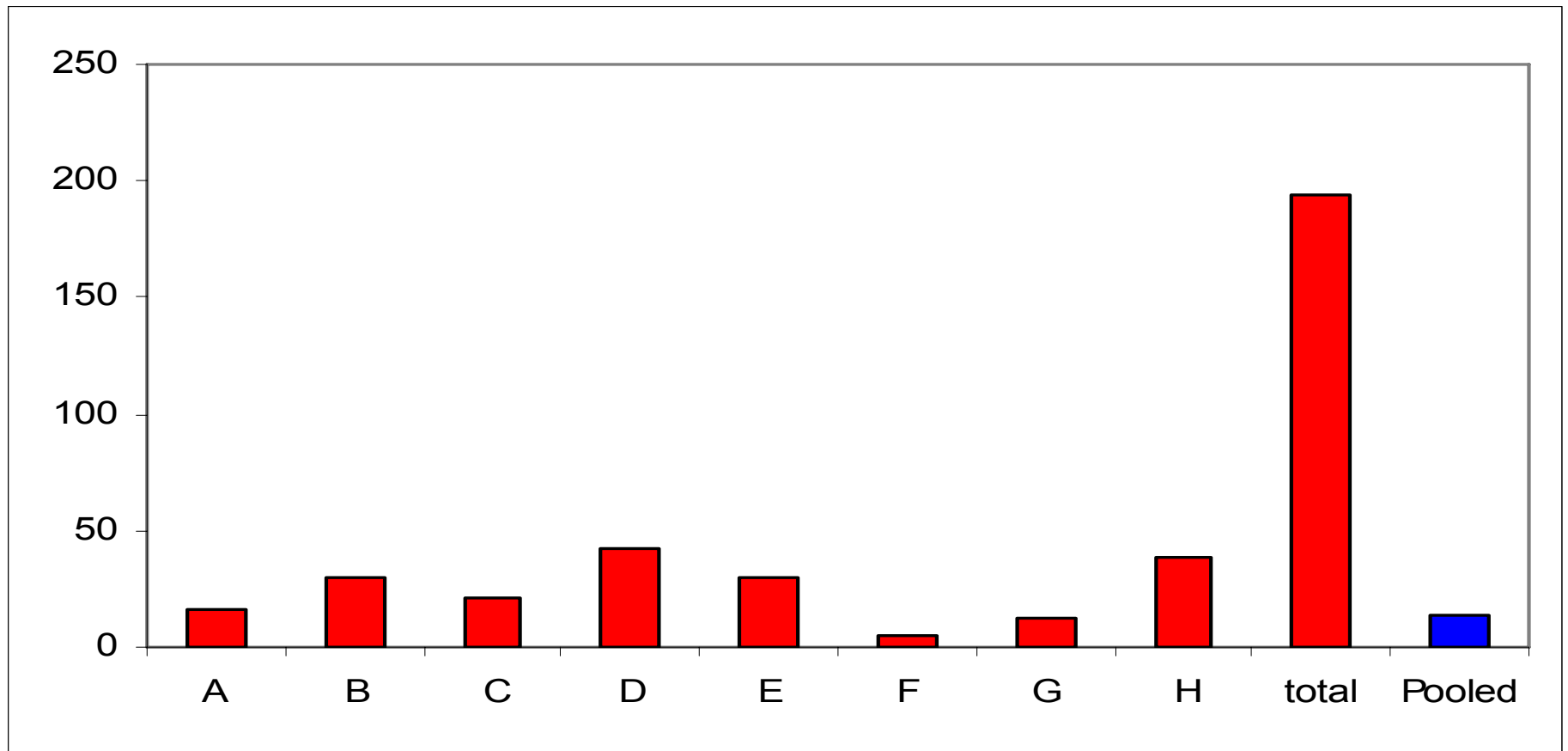
Short term

- Optimise current capacity
 - Reduce number of queues
 - Pool requests in date order
 - Pool capacity

For Long term:

- Plan for no queue
 - Measure demand, plan capacity
 - Reduce variation

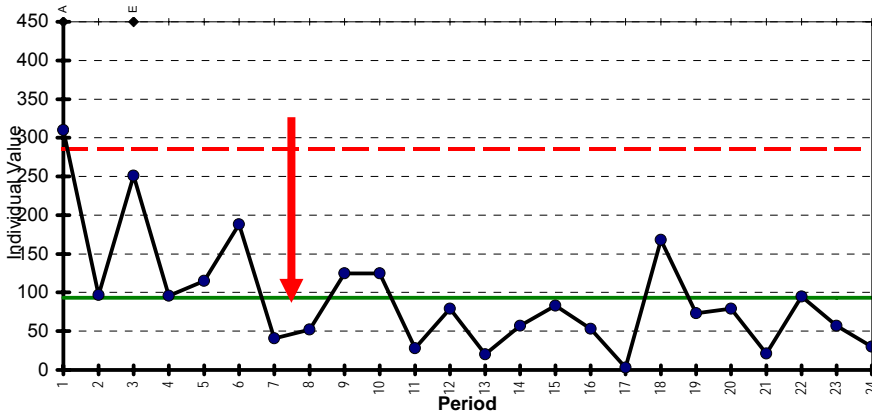
Effect of Pooling



Bowel cancer

days from receipt of GP referral to surgery

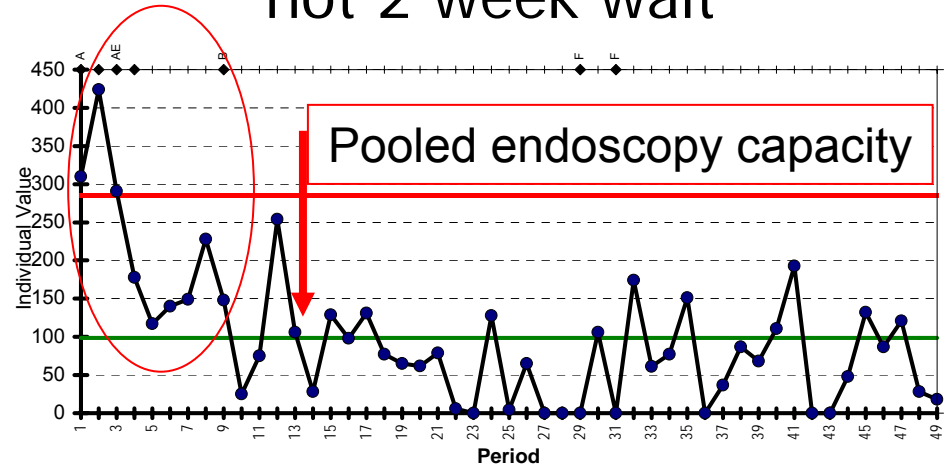
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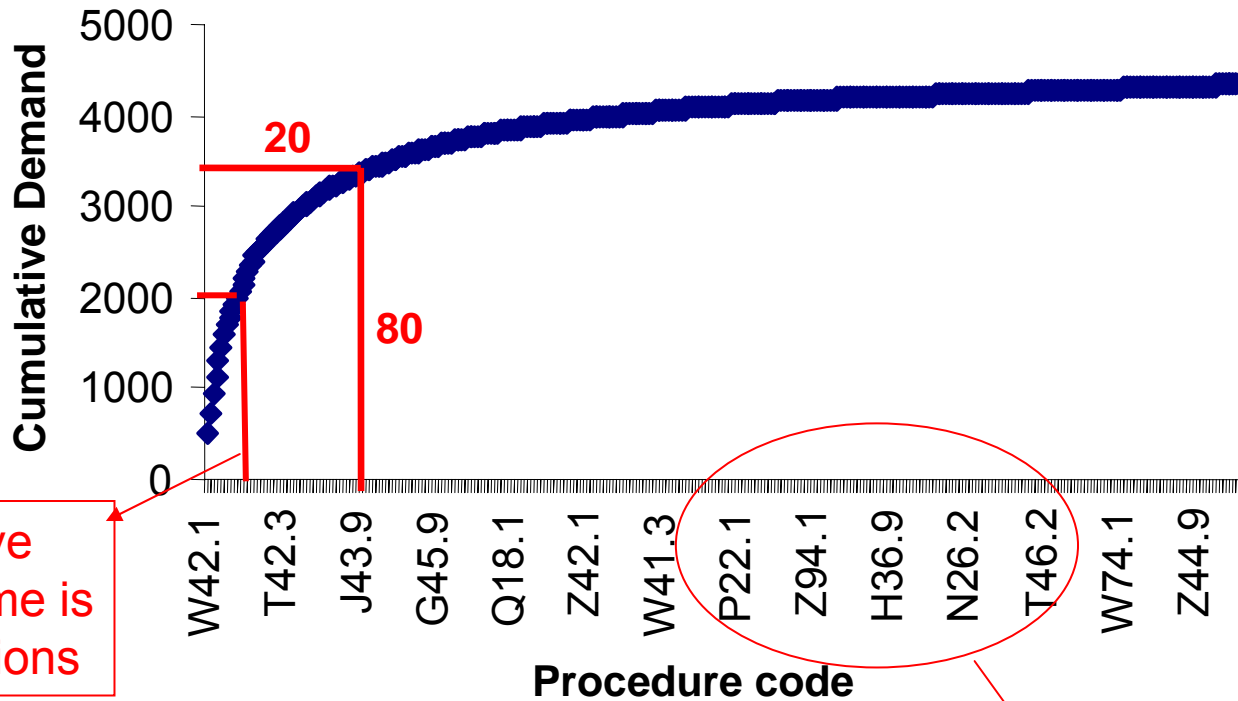


30th May 02

8th March 04

Effect of pooling

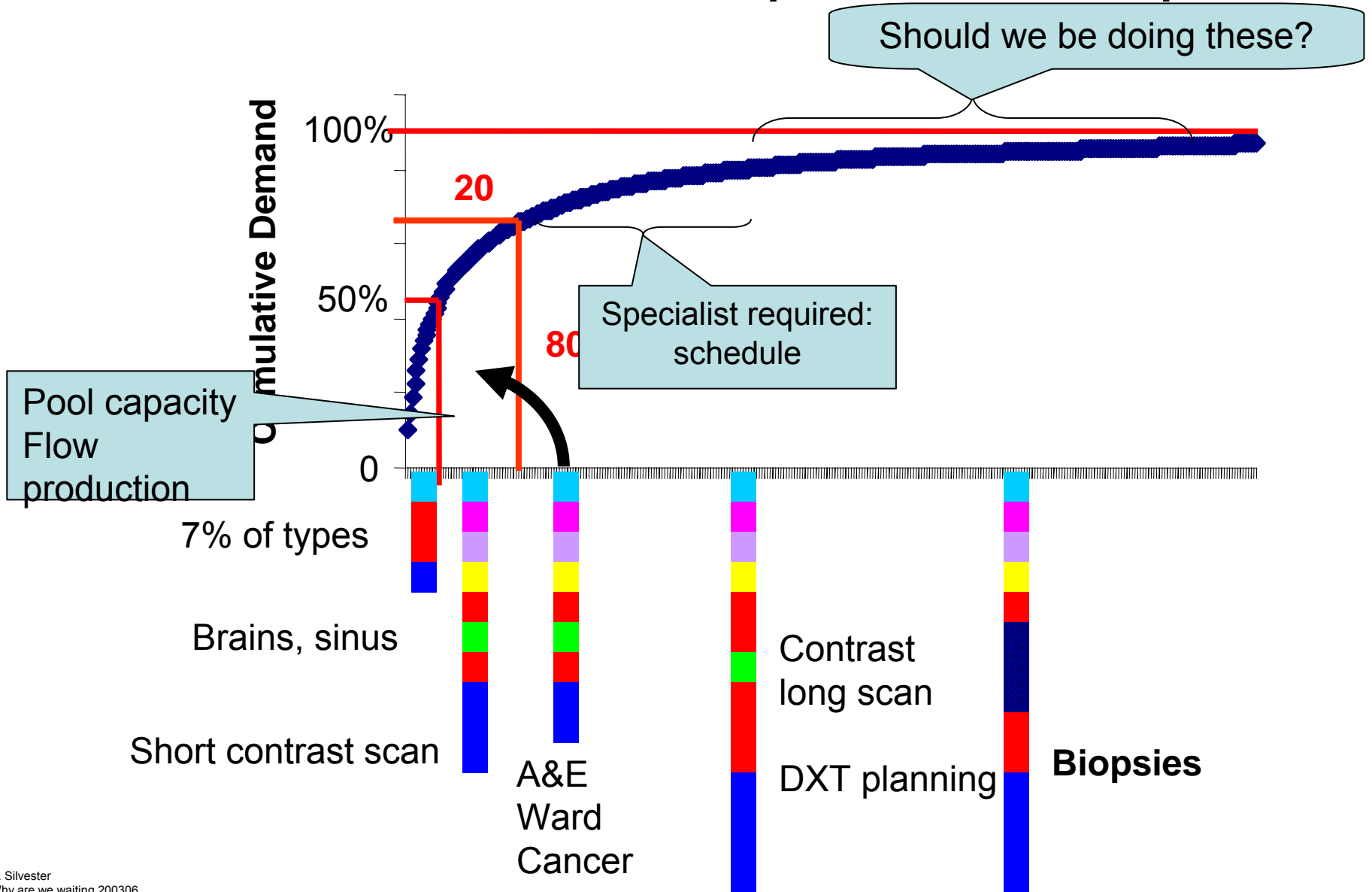
Pareto Analysis



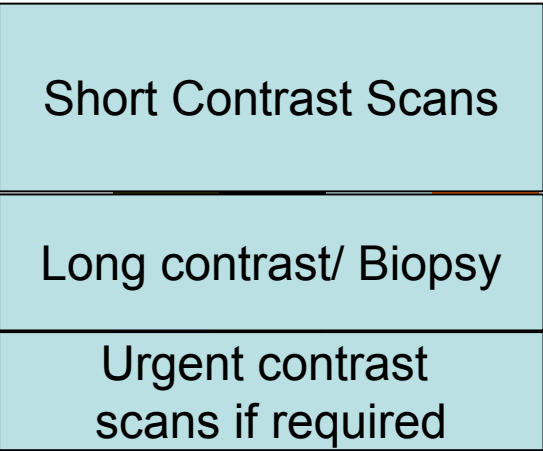
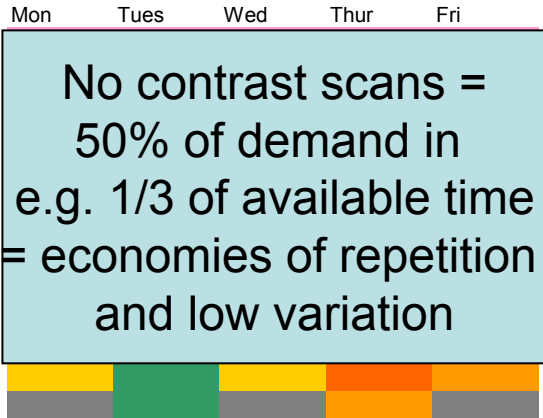
Glenday sieve
50% of volume is
7% of conditions

Group and pool similar
Procedures:
Process templates

Pareto CT demand v process template



Flow v batch production schedule:

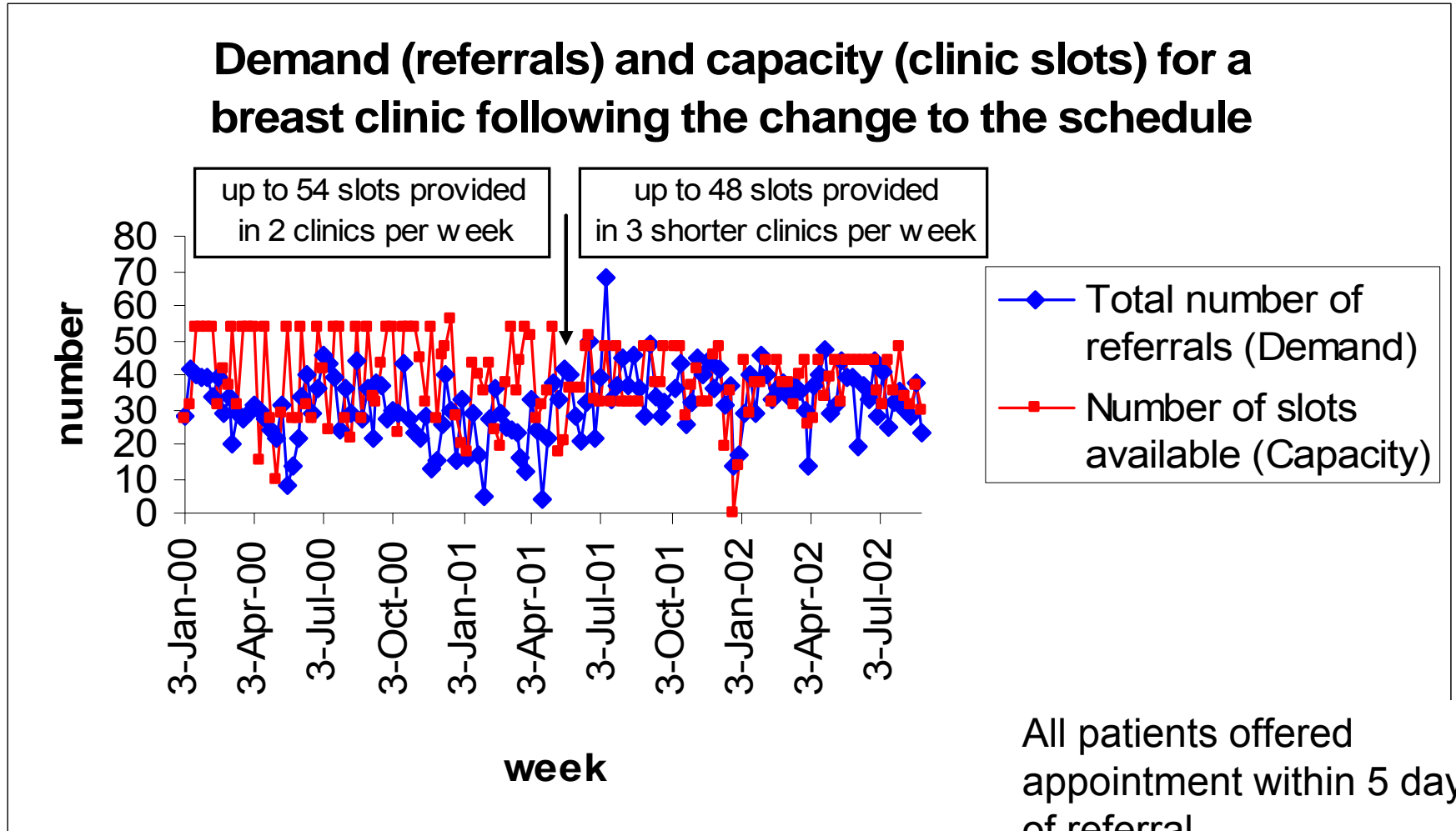


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- OP - Vascular
- IP - Orthop
- OP- Orthop
- IP- CTPA
- OP - Chest

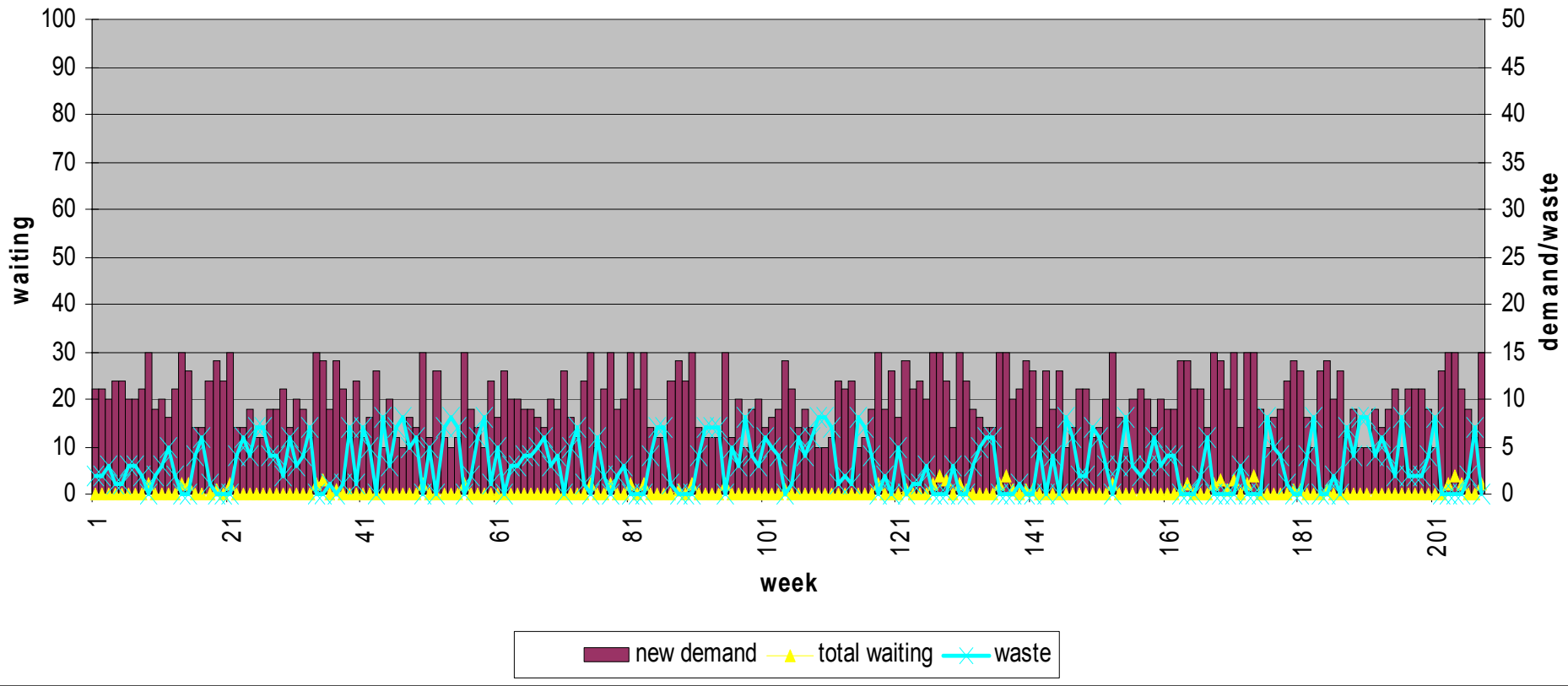
- HRCT
- OP - Brain, sinus - No Contast
- OP - Urgent Chest

- Biopsy
- OP- UGI
- IP - Body only
- Lunch
- OP - Urgent Gynae
- OP - Abdo
- Radiothreapy
- IP- Brain
- Chemo

Reducing batch size (carve out): reducing batch size



How to contract the right capacity



For model go to [www.steyn.org.uk/models/demand analysis.xls](http://www.steyn.org.uk/models/demand%20analysis.xls)

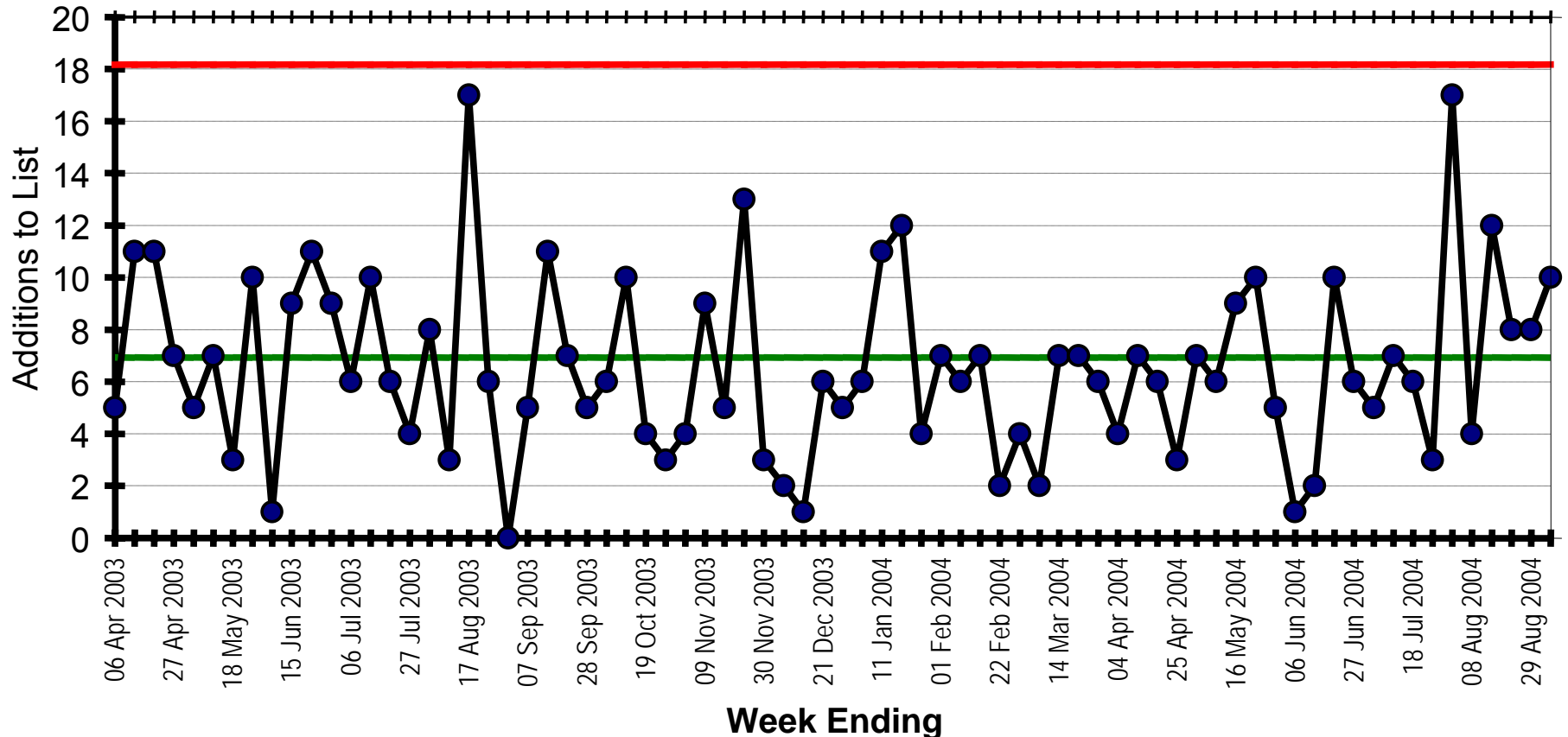
Look at the data!

- For DO IT NOW demand:
 - Set capacity at peaks of demand and accept ‘waste’
- For ‘I can wait a bit’ demand:
 - **Rule of thumb:**
 - Set **average** capacity at:
 - 80% of variation in demand + minimum demand
 - or 80% of ‘normal peaks in demand i.e. excluding special causes
- Predict variation, & flex capacity to match it
- Reduced variation = reduced cost.
 - Concentrate on improving quality to reduce variation
 - Lean / 6 sigma

Demand = requests for procedures

Additions to one surgeon's Daycase Waiting List

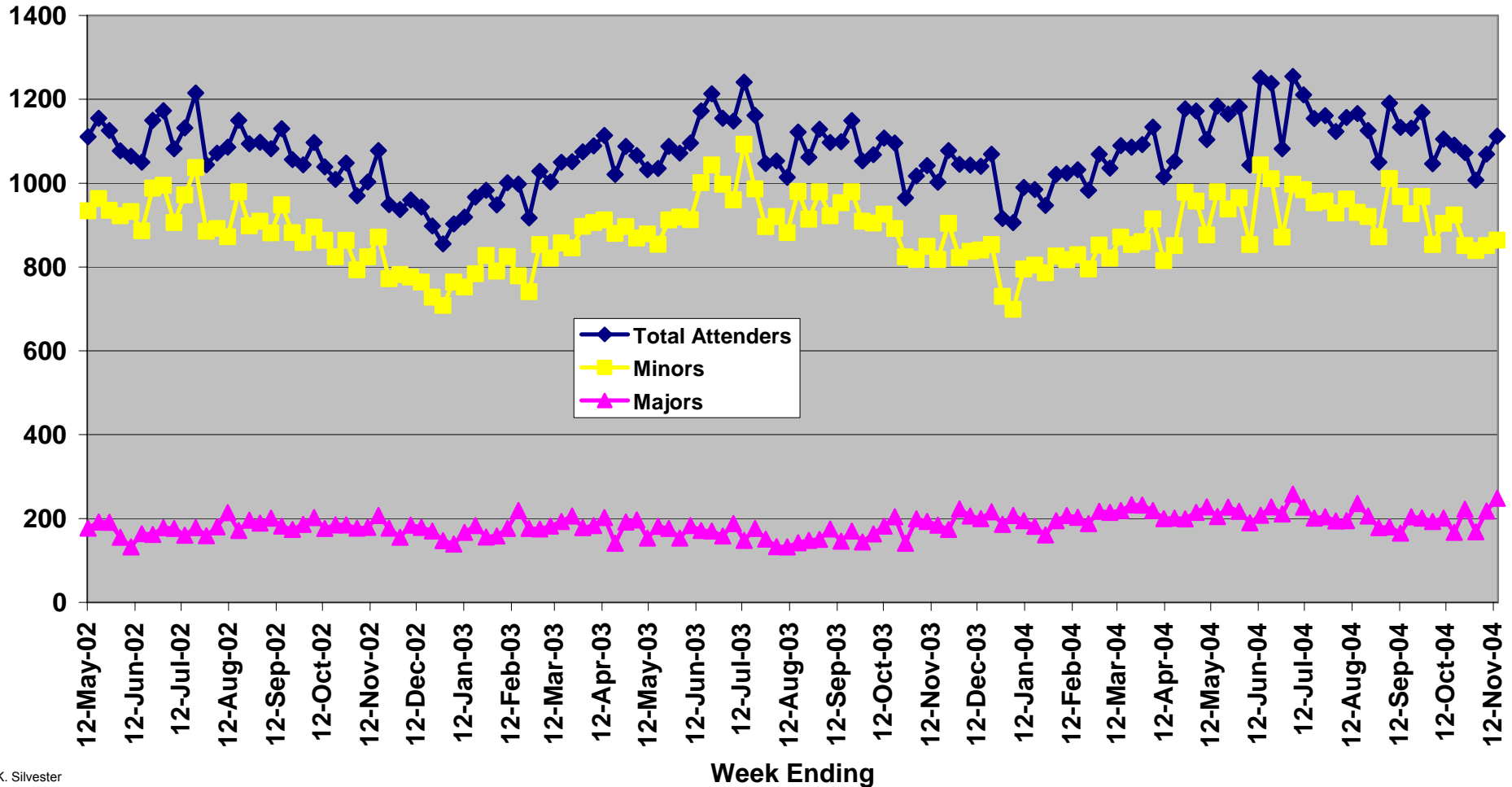
Special Cause Flag



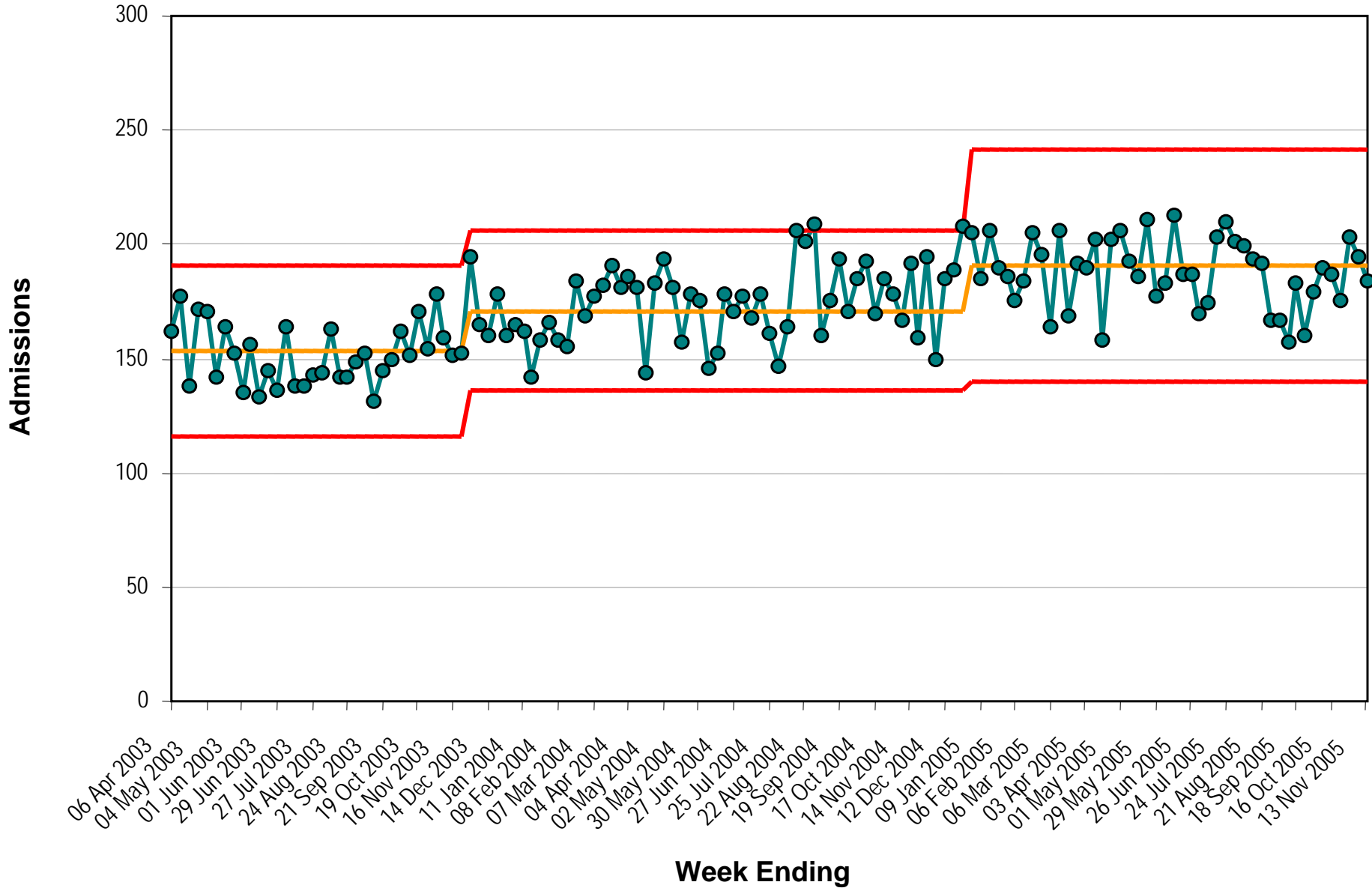
How many operating slots required ?

Emergency demand

Weekly A&E Attendances May 2002 to November 2004

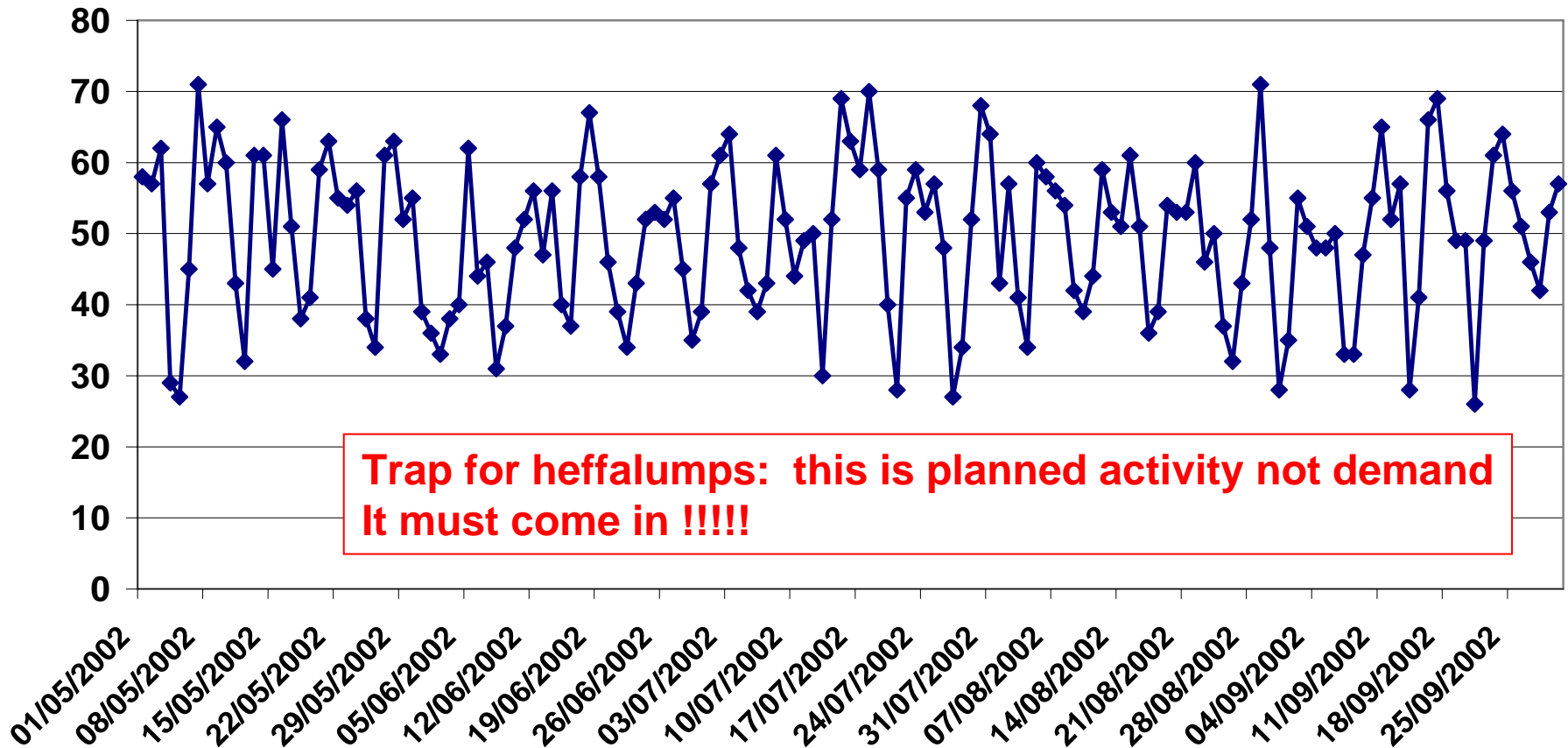


Weekly Admissions - Medical

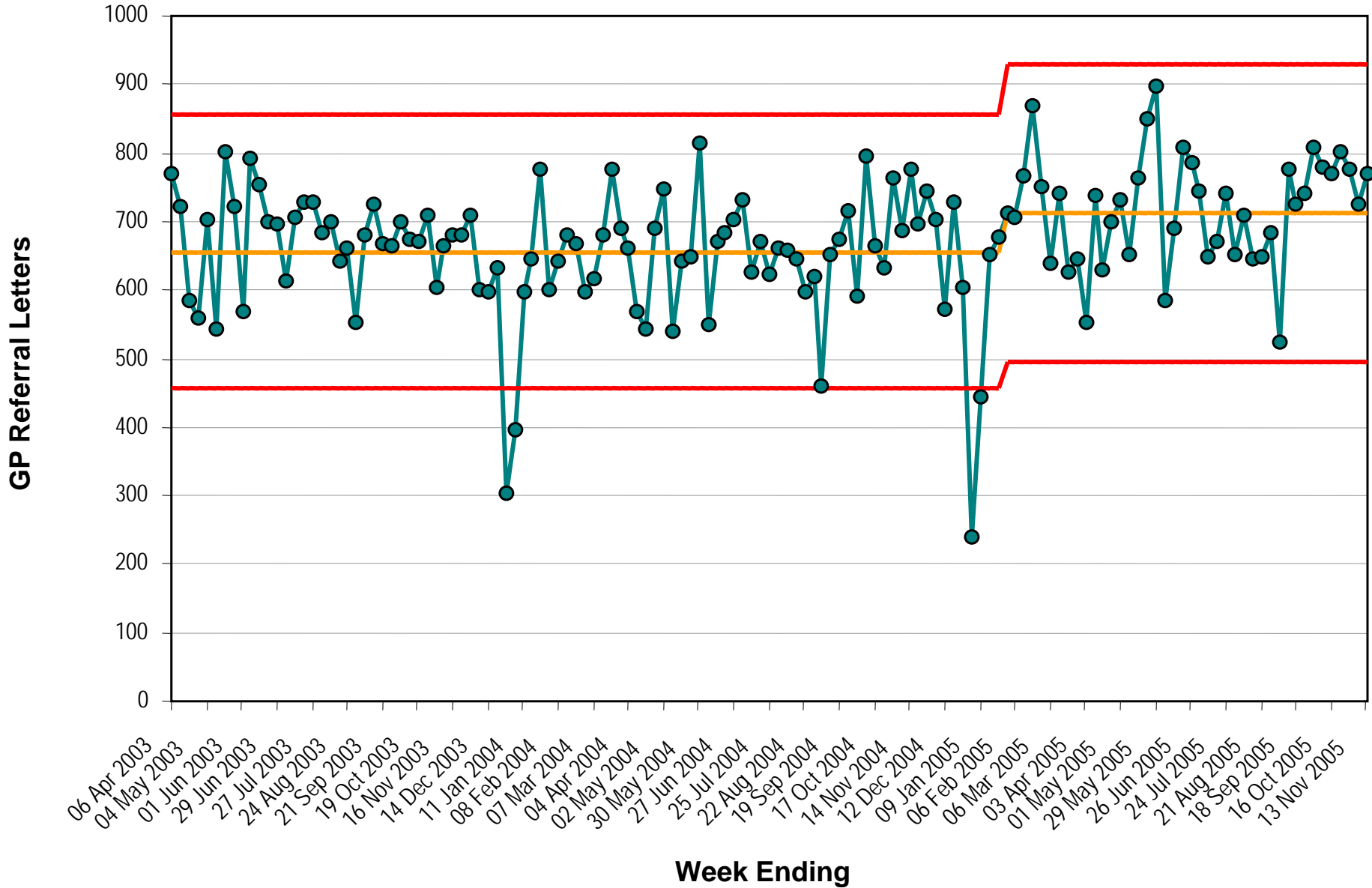


Demand for beds: daily elective and emergency admissions

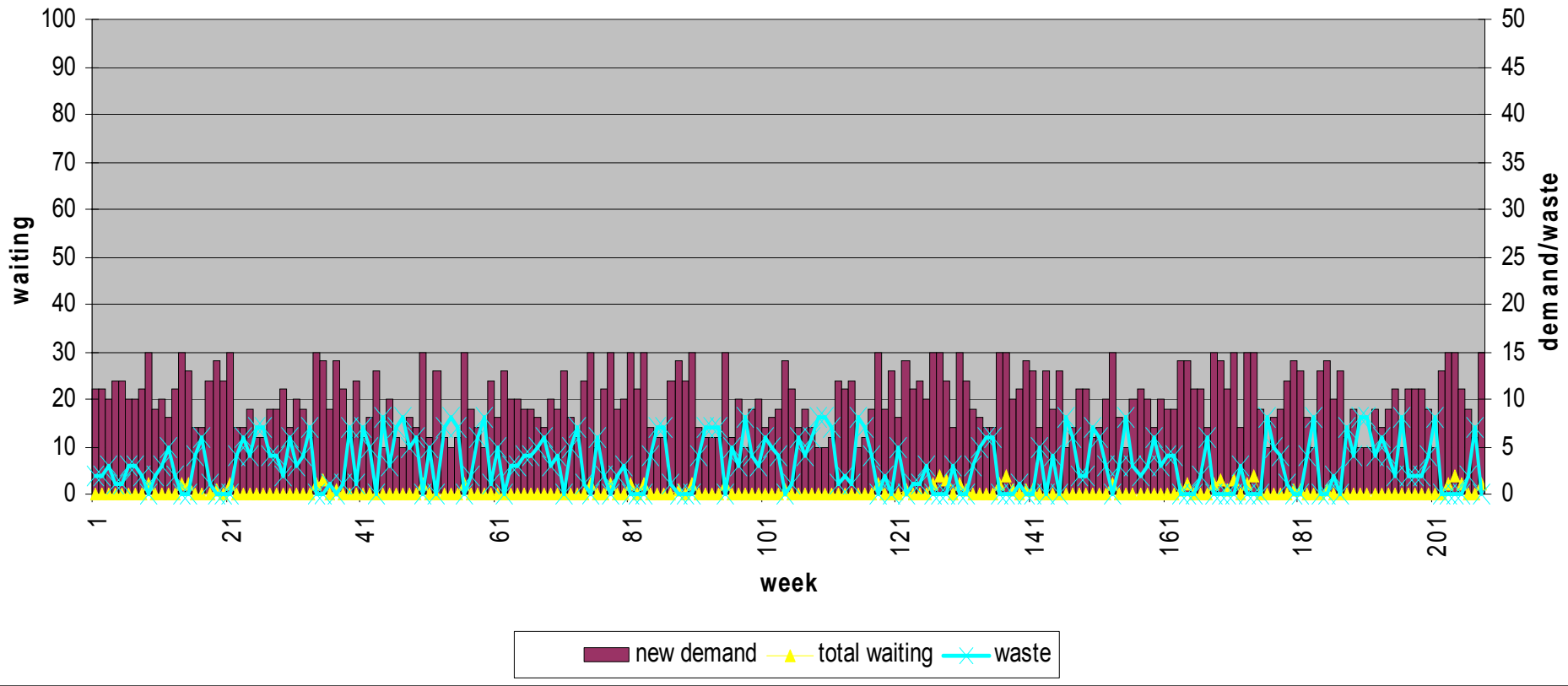
Total Intended Admissions
May 2002 - September 2002



Weekly GP Referrals

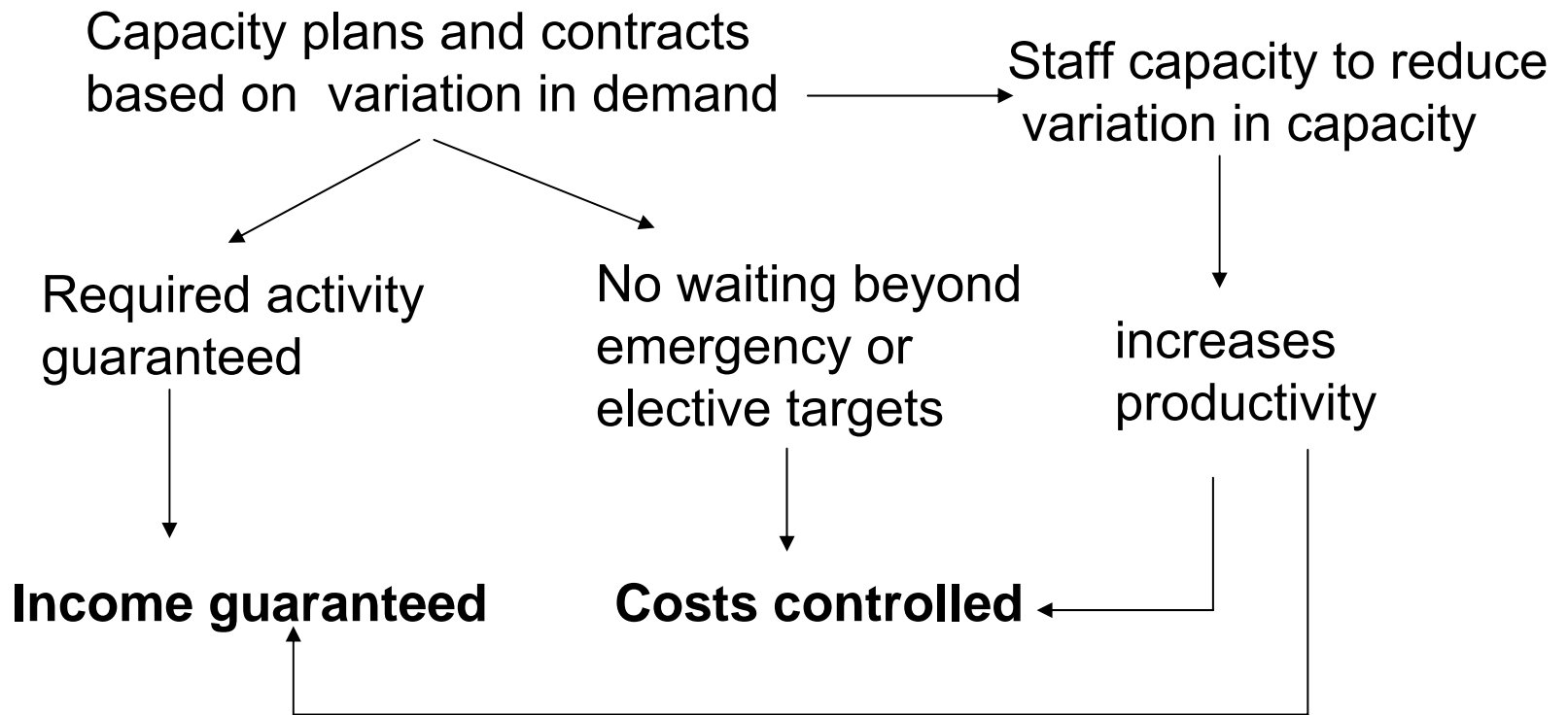


Making Capacity Affordable



For model go to [www.steyn.org.uk/models/demand analysis.xls](http://www.steyn.org.uk/models/demand%20analysis.xls)

The road to financial health



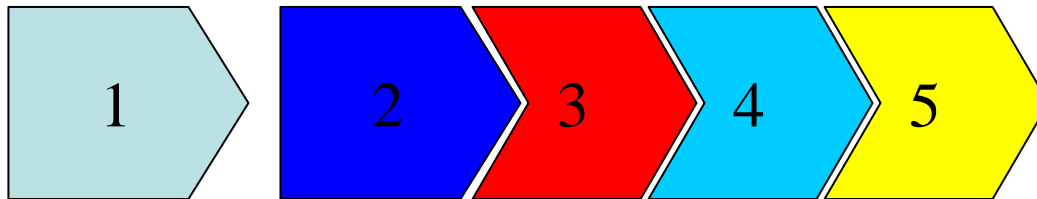
Key lessons:

Looking at one 'step' in a service

- Demand and Capacity vary
- If average demand = average capacity → queue
- Have to set capacity at a level to prevent queue → slack
- Capacity > required activity
- Cost of Capacity = \leq activity x (rate)

Running the NHS

Computer Model Demonstration



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You can't use these models for real life data