Critical Care Outreach
Promises and realities

MAAGIC report, 11th May 2005

National Outreach Forum

- Critical care networks
- AHPs
- BACCN
- CCIAG
- ICNARC
- ICS
- RCN CCF

DoH and Modernisation Agency

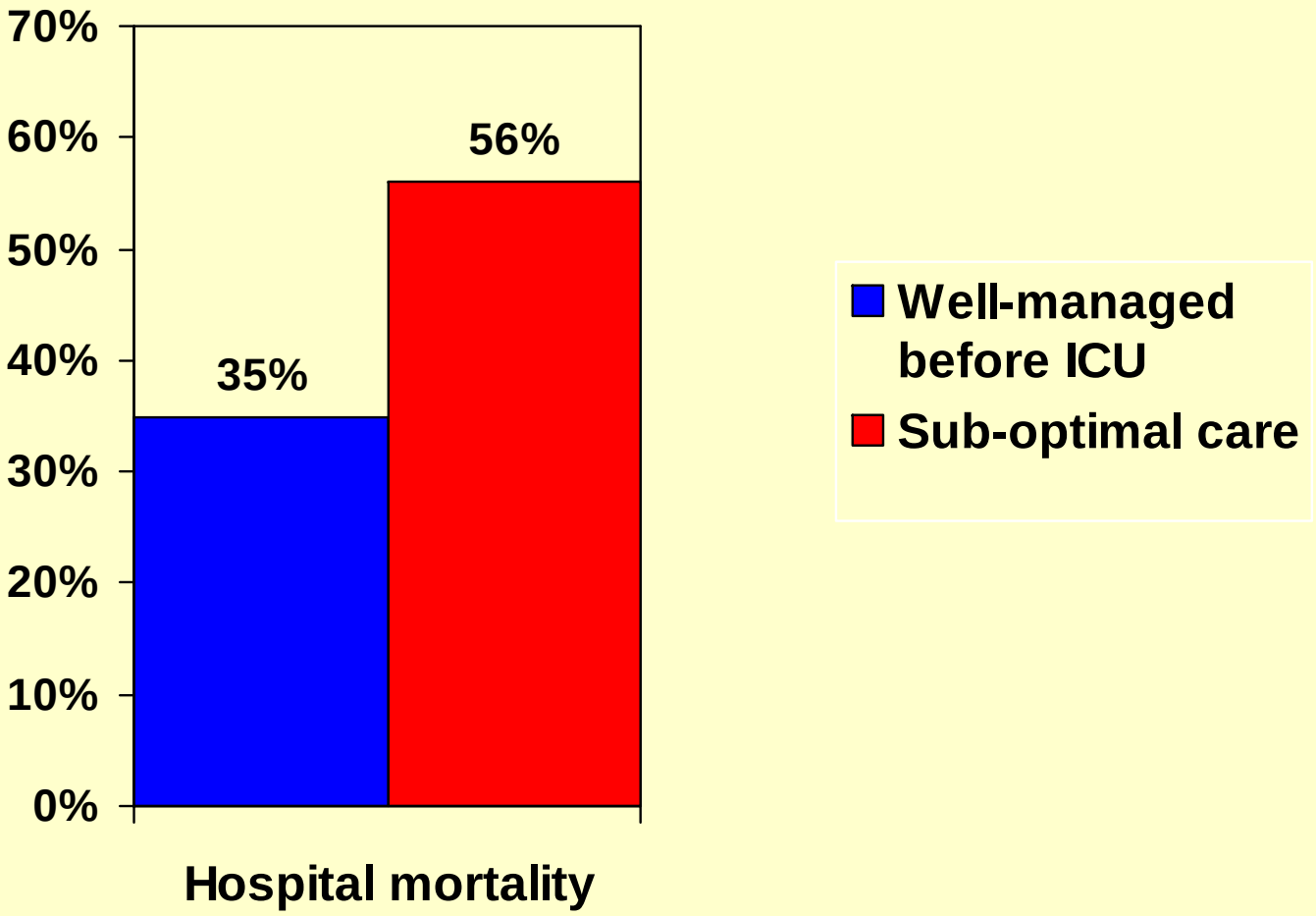
Key points from the report …

- 10.8% patients have adverse events: half are preventable
- 36% patients receive suboptimal care pre-ICU
- 41% of ICU admissions potentially avoidable

Actually, old news - unfortunately

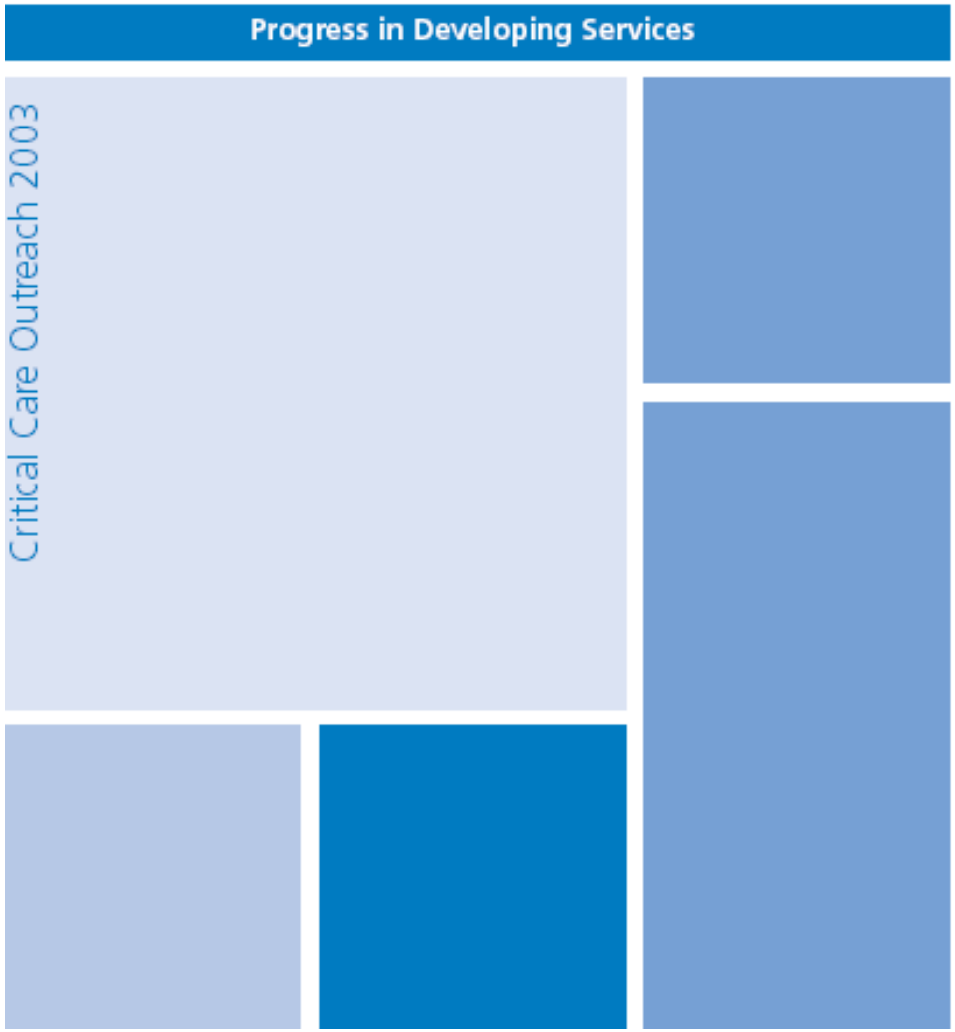
- 10.8% patients have adverse events: half are preventable
  - 1999-2000 data: Vincent *et al* BMJ 322(7285)
- 36% patients receive suboptimal care pre-ICU
  - 1996 data: McGloin *et al* J R Coll Physicians Lond 33(3)
- 41% of ICU admissions potentially avoidable
  - 1992-1993 data: McQuillan *et al* BMJ 316(7148)

Effect of Sub-optimal Care



McQuillan *et al* BMJ 316(7148) 'Quality of care before admission to ICU'

NHS
Modernisation Agency



Outreach is "an organisational approach to ensure equity of care for all critically ill patients, irrespective of their location"

Critical Care Stakeholders 2005

Outreach processes:

- Early identification of at-risk - “track & trigger” systems
- Rapid referral to expert help for early tx (? non-drs)
- Timely transfer to critical care when needed
- Safe discharge from critical care back to ward
- Supporting recovery from critical illness
- Sharing critical care skills
- Coordinating collaborative, continuous care
- Auditing, improving standards of critical care

Promises, promises

Advocates of Outreach:

- Audit Commission 1999
- DoH Expert Group 2000
- DoH/Modernisation Agency 2003
- Secretary of State for Health 2003:
  - “we should see outreach services … in every hospital”
- Royal Colleges of Anaesthetists, Nursing, Physicians, Surgeons - and National Patient Safety Agency 2004
- NCEPOD 2005
- Critical Care Stakeholders Forum 2005

(Grim) Realities

- 95/211 (45%) of hospitals don't have Outreach

  NCEPOD 2005 – data from 2003

- 63% of Outreach only in weekday working hours
- 2.26 WTE staff on average
  - F and G grade nurses
- 17.2 WTE doctors in total doing Outreach

  National Critical Care Outreach Survey 2002

Does Outreach Work?

12 studies of arrest rates/unplanned ICU admissions/hospital mortality

Ball C, Kirkby M, Williams S; Bellomo R, Goldsmith D, Uchino S, et al (x2); Bristow PJ, Hillman KM, Chey T, et al; Buist MD, Moore GE, Bernard SA, et al; DeVita MA, Braithwaite RS, Mahidhara R, et al; Goldhill DR, Worthington L, Mulcahy A, et al; Kenward G, Castle N, Hodgetts T, et al; Manthous CA, Amoateng-Adjepong Y, al-Kharrat T; Pittard AJ; Priestley G, Watson W, Rashidian A, et al; Salamonson Y, Kariyawasam A, van Heere B, et al; Subbe CP, Davies RG, Williams E, et al.

11 studies give Level III/IV evidence

- Fewer cardiac arrests
  - 4 positive, 3 neutral studies
- Fewer unplanned ICU admissions
  - 4 positive, 1 neutral
- Reduced mortality/increased survival
  - 5 positive, 4 neutral (1 Level I)
- *6 UK studies*
- *Mostly non-randomised, pre-post studies, not case-mix adjusted*

Ball et al 2003, BMJ

- 1,200-bed tertiary referral teaching hospital
- Non-randomised population based study
- 6 nurses, 12/7, one-year intervention period

	Survival to d/c	Readmissions
Before outreach: n = 201	162 (80.6%)	25 (12.4%)
After outreach: n = 269	235 (87.4%)	16 (6.4%)

- *6.8 % more survival to hospital discharge: risk ratio 1.08*
  6.4 % fewer readmissions to critical care: risk ratio 0.48

Goldhill et al 1999, Anaesthesia

- Large teaching hospital
- Unrandomised 6 month prospective study
- Patient-at-Risk Team

- 3.6% incidence of arrest for those seen by PART, 30.4% for those not seen (PART not called)
  ($p < 0.005$)

  25% ICU mortality if seen by PART, 40% if not

Pittard 2003, Anaesthesia

- Large teaching hospital, 3 wards
- Analysis of 6 month Consultant-led intervention
- Unplanned admissions: 58% to 43% (p= 0.05)

Reduced ICU mortality

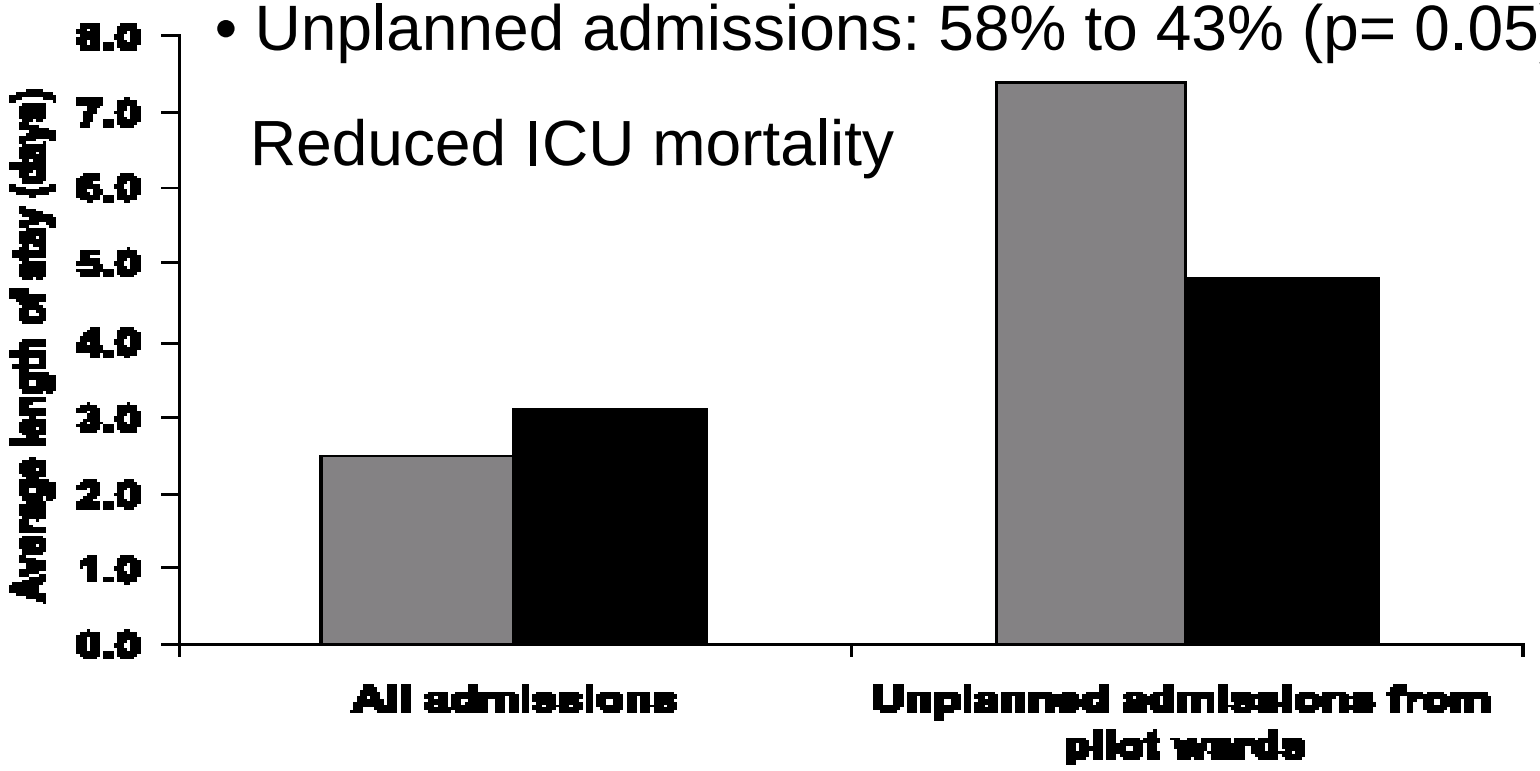


Figure 2 The average length of stay on ICU for all admissions and for unplanned admissions from pilot wards prior to outreach (light bars) and following the introduction of an outreach service (dark bars).

Priestley et al 2004, ICM

- 800-bed hospital, 16 wards
- Cluster randomized trial design: Level I RCT
- Phased introduction of 24 hour medical and nursing outreach over 32 weeks

- Hospital mortality rates reduced (vs controls):

  two-level odds ratio: 0.52 (95% CI: 0.32-0.85)

2 non-significant UK studies

- Subbe et al 2003, Anaesthesia
  - only 3 month intervention period
- Kenward et al 2004, Resuscitation
  - small numbers receiving MET input

The Australian experience

- 5 studies with positive results

- MERIT multi-centre study

  (Medical Early Response, Intervention & Therapy)
  - underpowered (!)
  - intervention hospitals often **not** recording vital signs and not calling team
    - ? short set-up time

Medical Emergency Team Example Calling Criteria

- **A**irway threatened
- **B**reathing
  - Respiratory arrest
  - RR < 5 / >36
- **C**irculation
  - Cardiac arrest
  - PR < 40 or PR >140
  - Systolic BP < 90
- **D**isability
  - Fall in GCS > 2
- Other concerns

The Australian experience

- 5 studies with positive results
- MERIT multi-centre study

  (Medical Early Response, Intervention & Therapy)
  - underpowered (!)
  - intervention hospitals often **not** recording vital signs and not calling team
    - ? short set-up time
- Education for all

So, what works, what doesn't?

- Current systems don't work
- Cardiac arrest teams don't work
  - 93.8% mortality from non-VF/VT arrests (Gwinnutt et al 2000, Resuscitation)
- Outreach can work …

- Outreach can work …

  as an integral part of an overall system

  – Need top-level support - and resources
  – Proactive *and* reactive team-working 24/7
  – Right people with right powers

  – … as well as dedicated critical care facilities and improved wards

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What do we do?

- 107 medical ‘1st visits’ analysed

More IV fluid/fluid challenge needed: 49% of cases

Oxygen (or more oxygen) needed: 45%

Bloods needed: 47%

Re-positioning needed: 28%

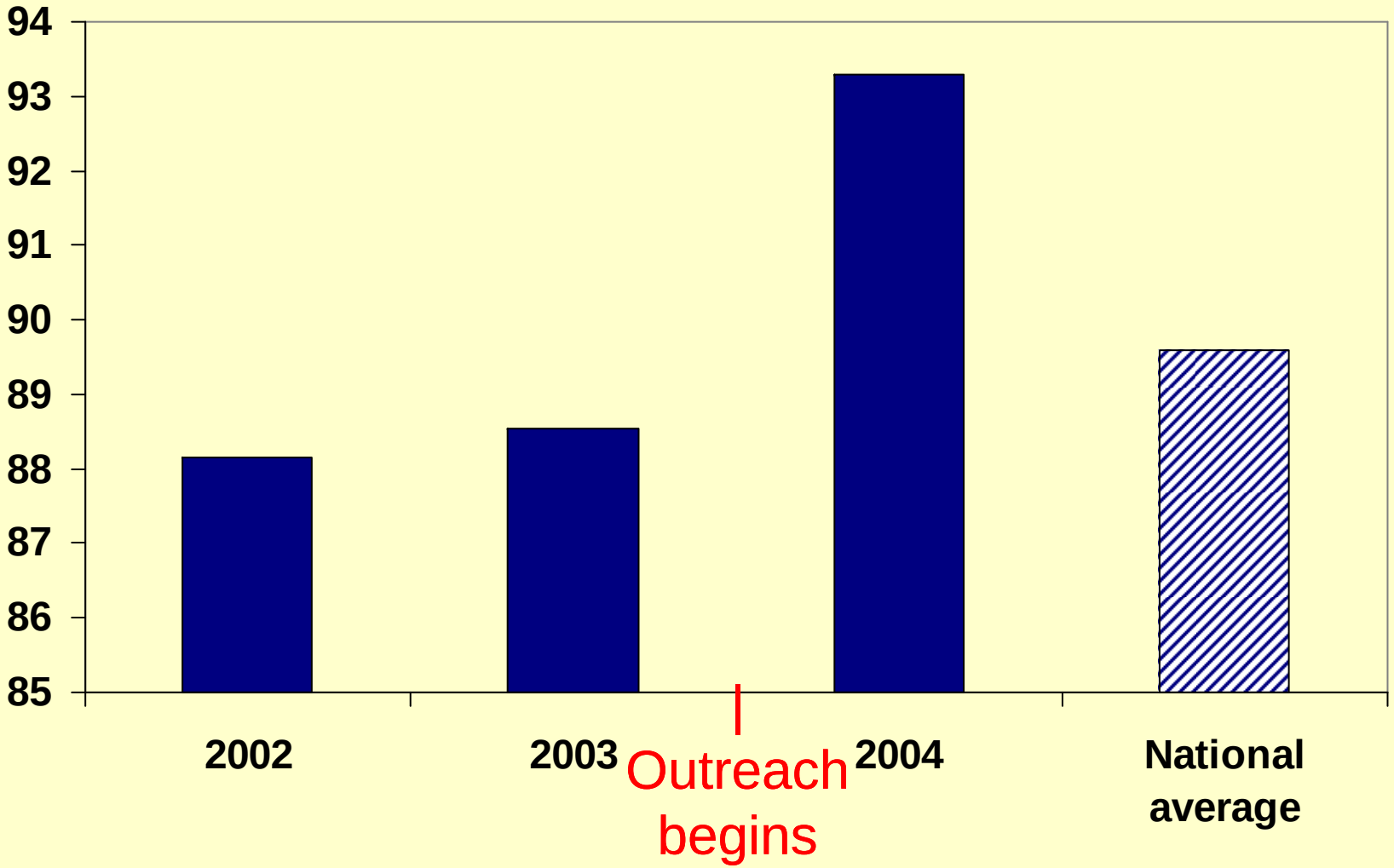
Septic screen needed: 27%

Bronchodilators needed: 20%

Respiratory support needed: 16%

Electrolytes/glucose; & nutrition: 16%

Airway opening/adjunct/suction needed (including traches)



Survival after discharge from Kingston ICU (%)