

Delivery of critical care outside the ICU

Kevin Morris
Birmingham, UK

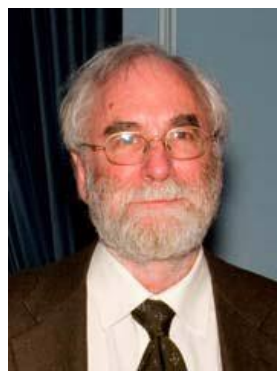
Class of 1994

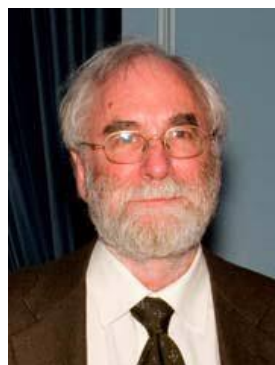
Class of 1995

Thanks for the memories.....









I learned so much clinical

- The educational value of a ward round attended by all ICU consultants
- Exposure to so many interesting patients
 - Cardiac physiology and the value of a good Cardiac Conference
 - Respiratory physiology and mechanical ventilation

I learned so much training

- That looking after and caring about trainees is central to their happiness (and allows you to work them >70 hours /week!)

I learned so much training

- That looking after and caring about trainees is central to their happiness (and allows you to work them >70 hours /week!)
- That feeding them croissants at rounds and doughnuts every weekend also helps!

I learned so much management/ 'politics'

- That strong leadership of the ICU team(s) is essential
- The importance of leaders with strategic vision

I learned so much research

- That important research can evolve out of everyday clinical questions
- That clinical research is enjoyable! And made easier if surrounded by those who can help you

1997 to present



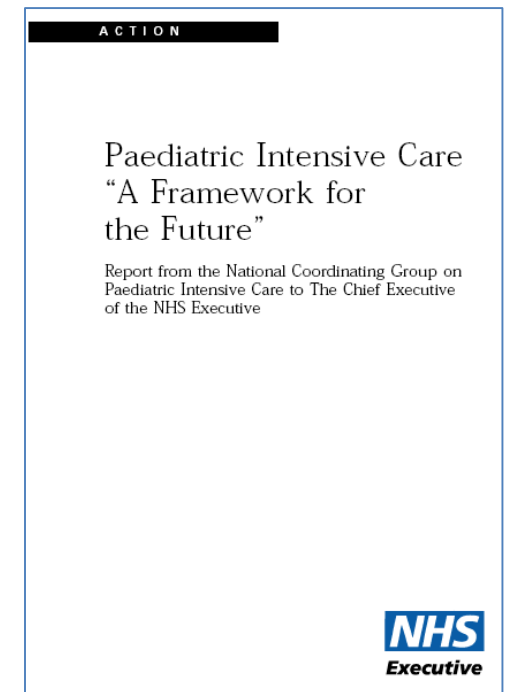
A framework for the future 1997



- Intensive care for children happens in lots of different places – PICUs, adult ICUs, wards
- No clear idea of numbers
- Staffing skill levels are not adequate
- No clear idea about outcomes

Proposed:


- collect national data
- undertake a review of all PICUs
- establish clear standards
- establish lead centres



Making a start with data



Paediatric Intensive Care Audit Network



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Paediatric Intensive Care Au

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PICANet is an international audit of paediatric intensive care which collects data on all children admitted to paediatric intensive care units (PICUs) in the UK and Ireland. It is coordinated by the Universities of Leeds and Leicester.



News

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2014 ANNUAL REPORT

APPENDICES

Paediatric Intensive
Care Audit Network



JANUARY 2011 – DECEMBER 2013



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PICANet: A DECADE OF DATA




Paediatric Intensive Care Audit Network

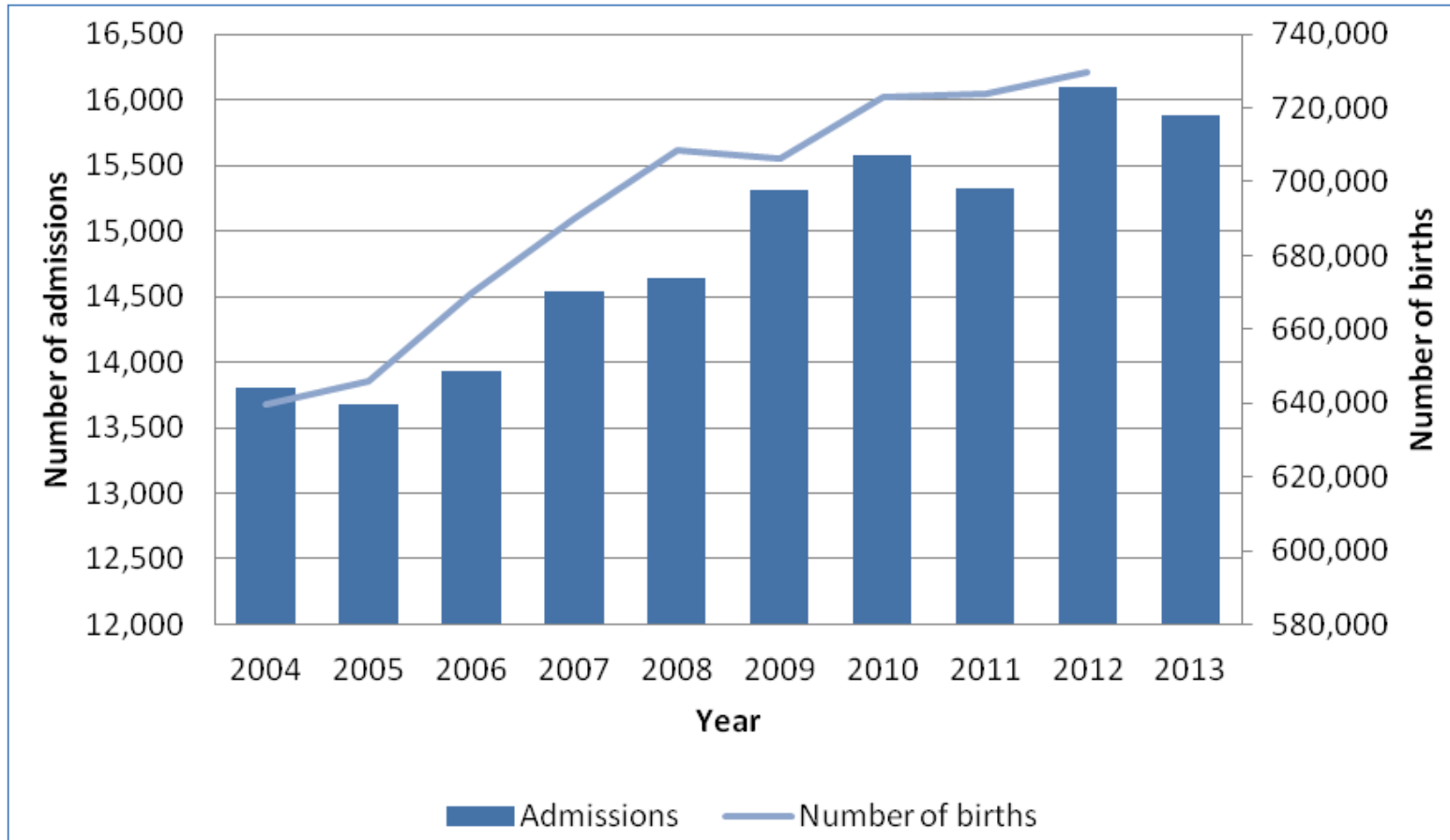
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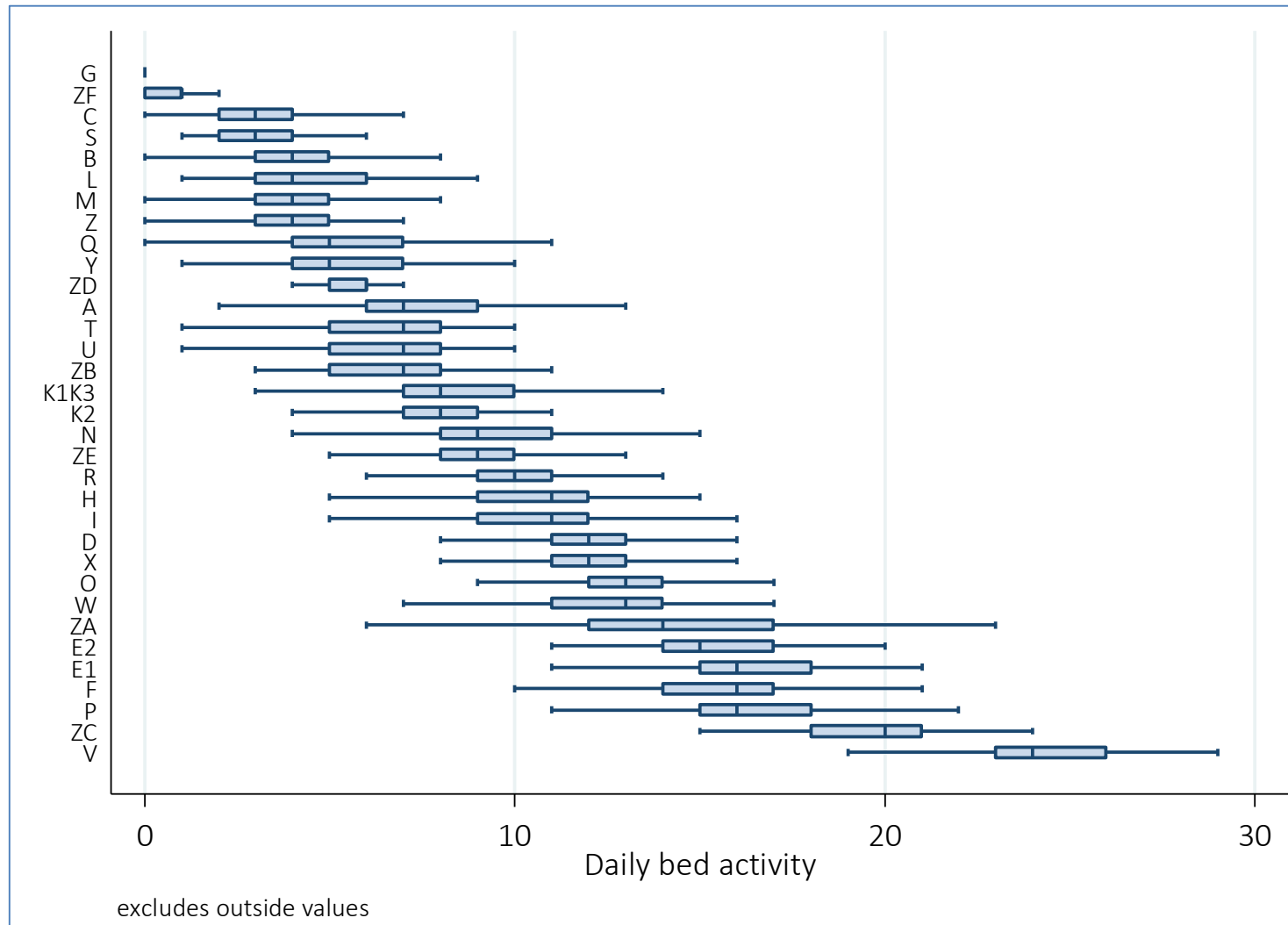
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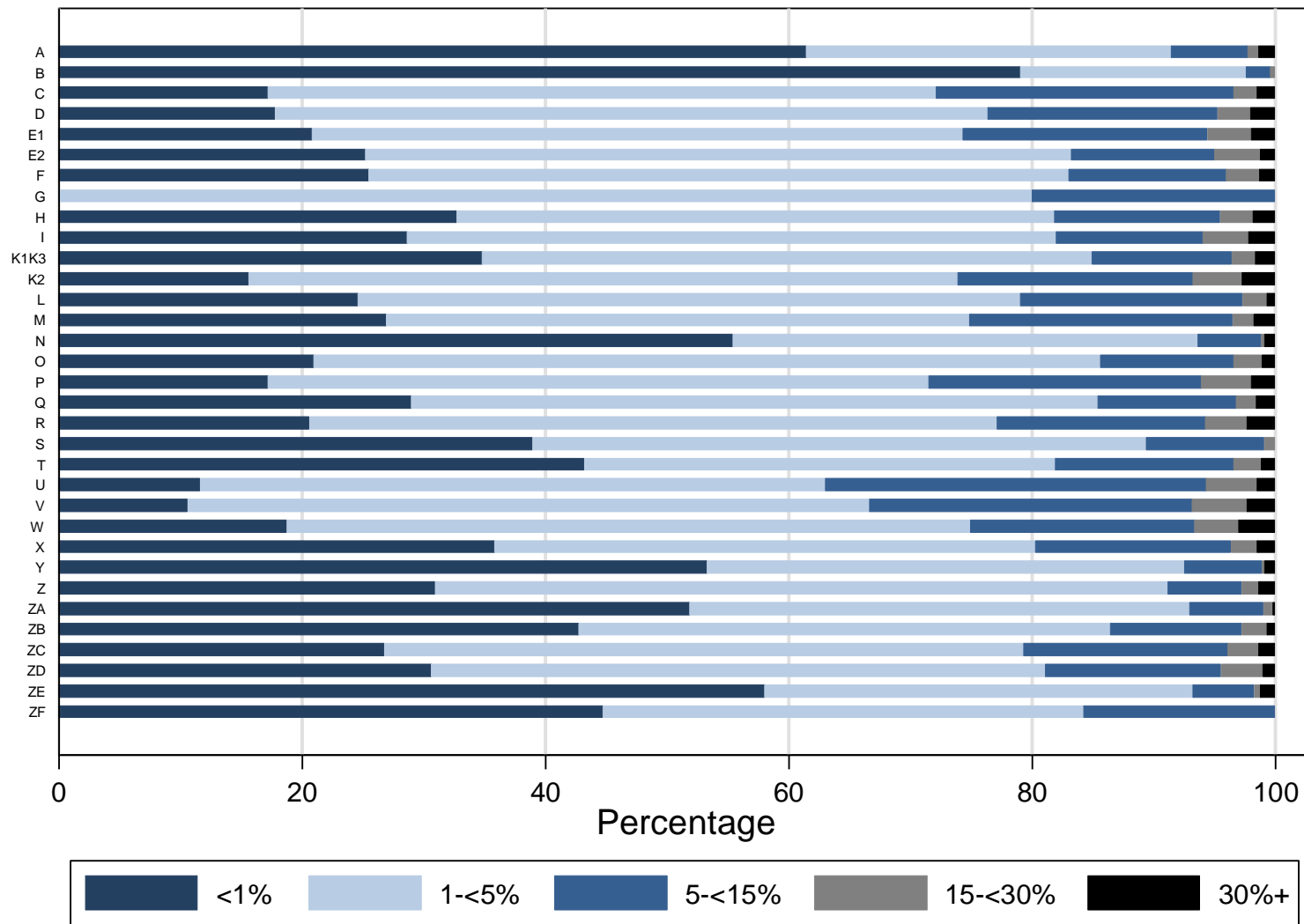
PICANet – increasing admissions year on year



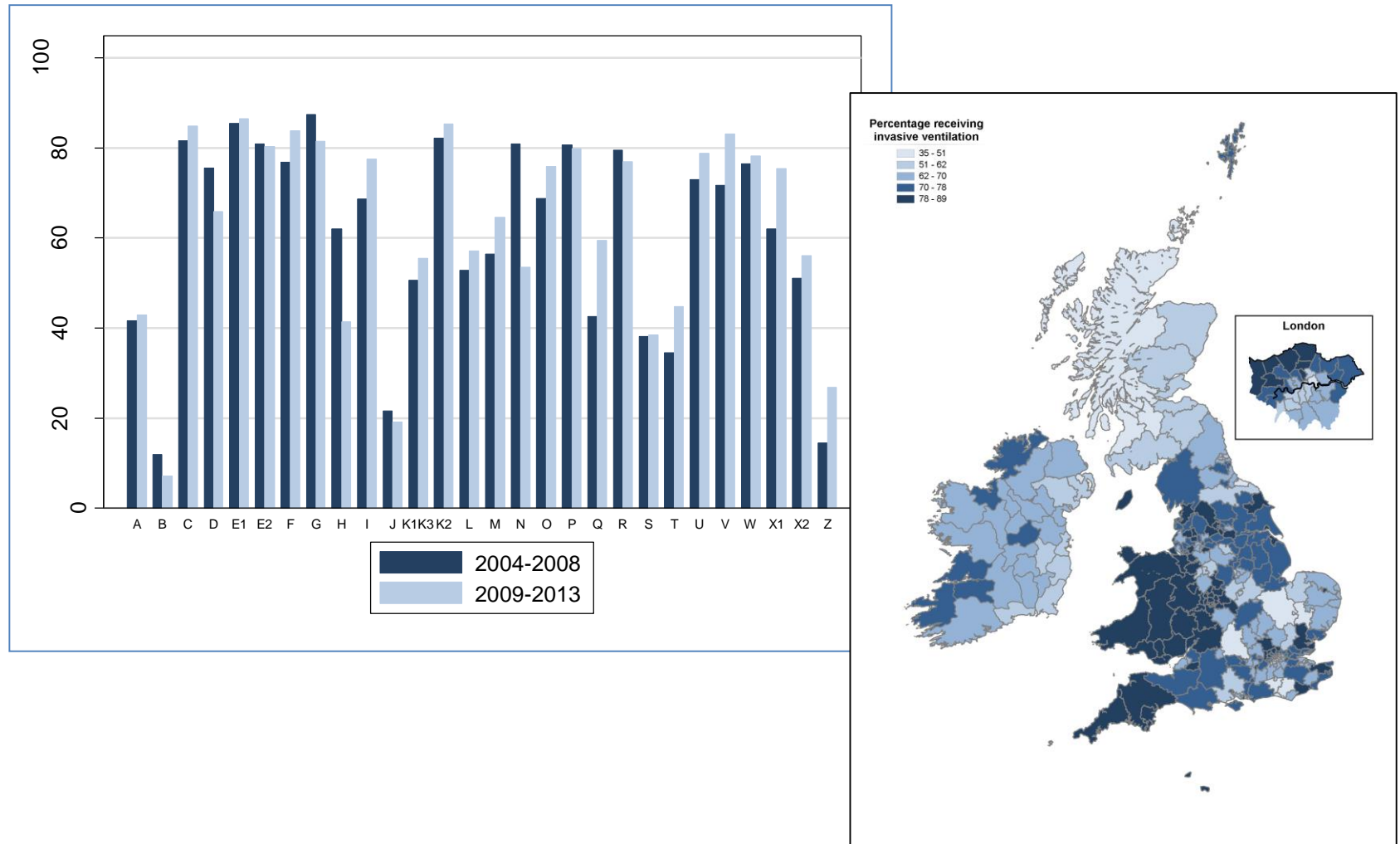
Number of children in each PICU (max per day) (n=33)



Distribution of Mortality Risk (PIM2) by unit (2013 data)



Variation between units – invasive ventilation



Research

Randomised Controlled Trials in the UK – the early studies were thanks to Canada!

The NEW ENGLAND JOURNAL *of* MEDICINE

ESTABLISHED IN 1812

APRIL 19, 2007

VOL. 356 NO. 16

Transfusion Strategies for Patients in Pediatric Intensive Care Units

Jacques Lacroix, M.D., Paul C. Hébert, M.D., James S. Hutchison, M.D., Heather A. Hume, M.D.,
Marisa Tucci, M.D., Thierry Ducruet, M.Sc., France Gauvin, M.D., Jean-Paul Collet, M.D., Ph.D.,
Baruch J. Toledano, M.D., Pierre Robillard, M.D., Ari Joffe, M.D., Dominique Biarent, M.D.,
Kathleen Meert, M.D., and Mark J. Peters, M.D., for the TRIPICU Investigators,* the Canadian Critical Care
Trials Group, and the Pediatric Acute Lung Injury and Sepsis Investigators Network

The NEW ENGLAND JOURNAL *of* MEDICINE

ORIGINAL ARTICLE

Hypothermia Therapy after Traumatic Brain Injury in Children

James S. Hutchison, M.D., Roxanne E. Ward, B.A., Jacques Lacroix, M.D.,
Paul C. Hébert, M.D., M.H.Sc., Marcia A. Barnes, Ph.D., Desmond J. Bohn, M.B.,
Peter B. Dirks, M.D., Steve Doucette, M.Sc., Dean Fergusson, Ph.D.,
Ronald Gottesman, M.D., Ari R. Joffe, M.D., Haresh M. Kirpalani, M.B., M.Sc.,
Philippe G. Meyer, M.D., Kevin P. Morris, M.D., David Moher, Ph.D.,
Ram N. Singh, M.D., and Peter W. Skippen, M.D., for the Hypothermia Pediatric
Head Injury Trial Investigators and the Canadian Critical Care Trials Group*

International collaboration

Randomised Controlled Trials in the UK

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ORIGINAL ARTICLE

Hypothermia Therapy after Traumatic Brain
Injury in Children

THAPCA TRIALS
Therapeutic Hypothermia After Pediatric Cardiac Arrest

funding by:

 National Heart Lung and Blood Institute
National Institutes of Health



International collaboration

Randomised Controlled Trials in the UK

UK only studies



The NEW ENGLAND JOURNAL of MEDICINE

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JANUARY 9, 2014

VOL. 370 NO. 2

A Randomized Trial of Hyperglycemic Control in Pediatric Intensive Care

Duncan Macrae, F.R.C.A., Richard Grieve, Ph.D., Elizabeth Allen, Ph.D., Zia Sadique, Ph.D., Kevin Morris, M.D.,
John Pappachan, F.R.C.A., Roger Parslow, Ph.D., Robert C. Tasker, M.D., and Diana Elbourne, Ph.D.,
for the CHiP Investigators*

BMJ

RESEARCH

Effect of “collaborative requesting” on consent rate for organ donation: randomised controlled trial (ACRE trial)

The ACRE Trial Collaborators

Impregnated central venous catheters for prevention of bloodstream infection in children (the CATCH trial): a randomised controlled trial



Ruth E Gilbert, Quen Mok, Kerry Dwan, Katie Harron, Tracy Moitt, Mike Millar, Padmanabhan Ramnarayan, Shane M Tibby, Dyfrig Hughes,
Carrol Gamble, for the CATCH trial investigators*



Randomised Controlled Trials in the UK

UK only studies



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THE **A-STOP** STUDY

Oxy-Picu



BMJ

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PESS



Use PICANet data in study design and to minimise trial data capture

The 'politics' - influencing the
local and national agenda

The 'politics' - influencing the local and national agenda

I discovered it was much easier to influence change at a national level than within my own hospital!

Commissioning Safe and Sustainable Specialised Paediatric Services

A Framework of Critical Inter-Dependencies

- Allergy • Blood and marrow transplantation
- Burns • CAMHS • Cardiology • Cardiothoracic surgery • Cleft lip and palate • Clinical Haematology
- Complex child & adolescent gynaecology • Cystic fibrosis • Dermatology • Endocrinology • ENT (Airway)
- Ear nose and throat surgery • Gastroenterology
- Haemophilia • Hepatology • HIV/AIDS treatment and care • Immunological disorder • Infectious disease
- Major trauma • Malignant haematology • Medical genetics • Metabolic medicine • Morbid obesity
- Neonatal intensive care • Neonatology • Nephrology
- Neurology • Neurosurgery • Non-malignant haematology • Nutritional support • Oncology
- Ophthalmology • Oral & maxillofacial surgery
- Orthopaedics and spinal surgery • Paediatric critical care • Pathology • Plastic surgery • Renal replacement therapy • Respiratory medicine • Rheumatology
- Specialised paediatric anaesthesia • Specialist paediatric surgery • Urology

Defining which paediatric services need to be co-located in the same hospital



Standards which would underpin a reconfiguration of cardiac surgical services

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Safe and
Special
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A Framework

- Allerg
- Burns
- surgery
- Comp
- fibrosis
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- Major
- genetic
- Neon
- Neuro
- haemat
- Opht
- Ortho
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- therapy
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- paediat



Management of Children with Major Trauma

NHS Clinical Advisory Group Report

February 2011

Improving the pathway for patients with major trauma

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Special
Paedia
A Framework

- Allerg
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- Comp
- fibrosis
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NHS
Specialised Services



CHILDREN'S NEUROSCIENCE NETWORKS (FOR THE NEUROSURGICAL CHILD): A FRAMEWORK FOR SERVICES IN ENGLAND

STEERING GROUP REPORT

FEBRUARY 2012

Developing more
joined up neurology
and neurosurgery
services for children

some success ...

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More than 1,600 extra trauma victims alive today says major new study

20 August 2018

Urgent and emergency care

The NHS in England has saved an additional 1,600 patients with severe injuries since major trauma centres were established in 2012.

Fig 1 Major Trauma Centres (MTCs) in England. Copyright NHS Choices 2012.



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EClinicalMedicine
Published by THE LANCET

Research Paper

Changing the System - Major Trauma Patients and Their Outcomes in the NHS (England) 2008-17

Christopher G. Moran^a, Fiona Lecky^b, Omar Bouamra^c, Tom Lawrence^c, Antoinette Edwards^c, Maralyn Woodford^c, Keith Willett^d, Timothy J. Coats^{e,*}

^a University of Nottingham, Derby Rd, Nottingham NG7 2UH, UK

^b Centre for Urgent and Emergency Care Research (CURE), Health Services Research Section, School of Health and Related Research, University of Sheffield, S1 4DA, UK

^c Trauma Research and Audit Network, University of Manchester, 3rd Floor Mayo Building, Salford Royal NHS Foundation Trust, Salford M6 8HD, UK

^d Kadoorie Research Centre, Nuffield Department of Orthopaedics, Rheumatology and Musculoskeletal Sciences, University of Oxford, Headley Way, Headington, Oxford OX3 9DU, UK

^e University of Leicester, University Road, Leicester LE1 7RH, UK

19% improvement
in risk adjusted
mortality

and some failure ...

... 4 years later and millions of pounds spent ...



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Child heart surgery reform suspended

By James Gallagher
Health and science reporter, BBC News

Controversial plans to reform children's heart surgery in England have been suspended as the decision was based on a "flawed analysis", Health Secretary Jeremy Hunt has announced.

The NHS had planned to concentrate care in fewer, bigger centres.

There was opposition to ending surgery at Leeds General Infirmary, Glenfield Hospital in Leicester and the Royal Brompton in London.

Mr Hunt ordered an independent review of the decision.

Repairing the hearts of children born with congenital defects is one of the most complex procedures in the NHS. About 3,700 such operations take place each year.



Where should surgery take place?

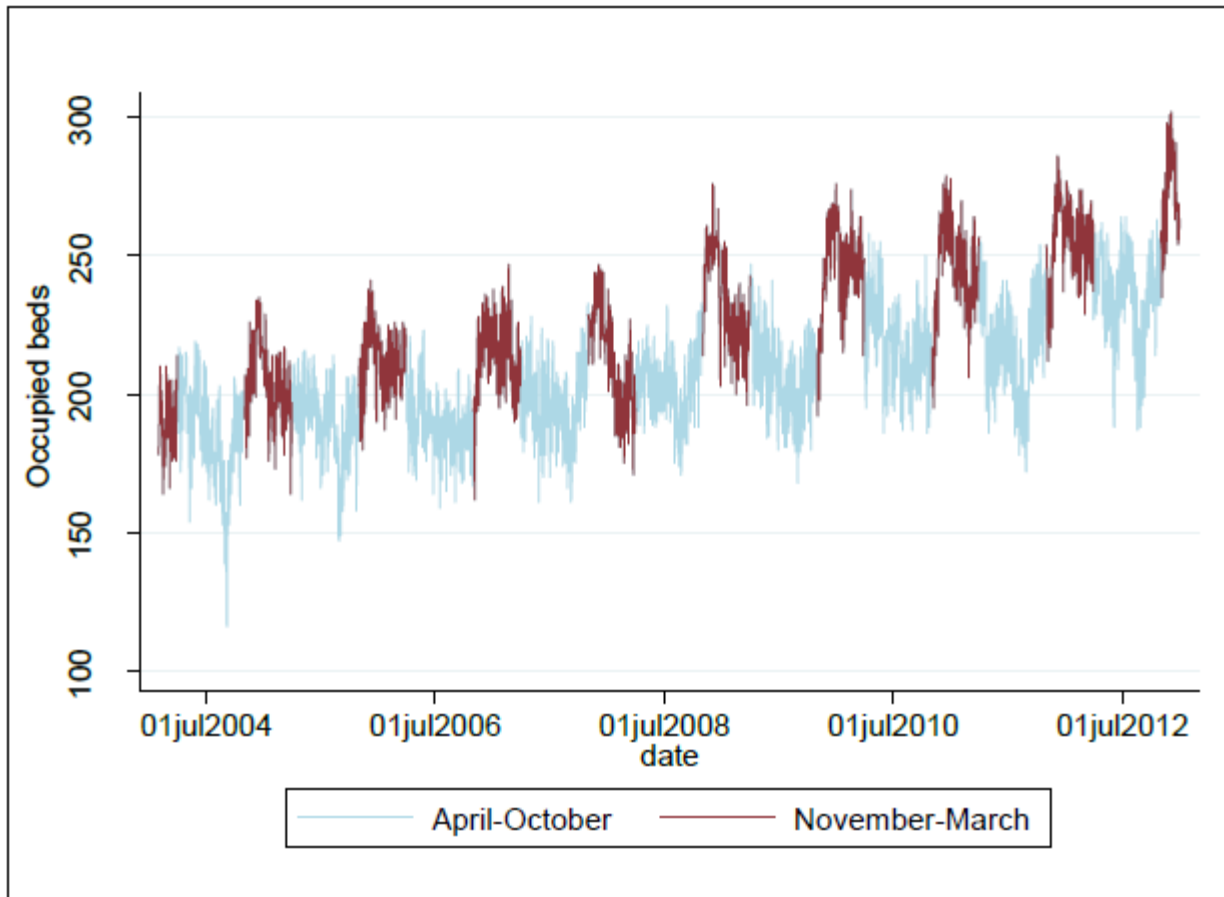
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[Child heart ops decision 'welcome'](#)

[Child heart surgery: Change still needed](#)

Not enough PICU beds

Winter surge and pressure on PIC capacity



.. need 55 more PICU beds in winter than in summer

... In 2012 news reaches 10 Downing St

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Shortage of critical care paediatric beds, doctors warn

The NHS is facing a shortage of beds to treat critically-ill children, doctors warn.

The Paediatric Intensive Care Society and three other medical organisations say all 29 units in the UK are running close to capacity due to a surge in seasonal respiratory illness.

The Department of Health is expected to release additional money to help hospitals with winter pressures.

On Monday there were 10-20 unoccupied beds available.

During the previous week, there were days when virtually all of the beds were full - although doctors stress no child came to any harm as a result.

Services stretched



SPL

The very young are particularly susceptible to severe chest infections

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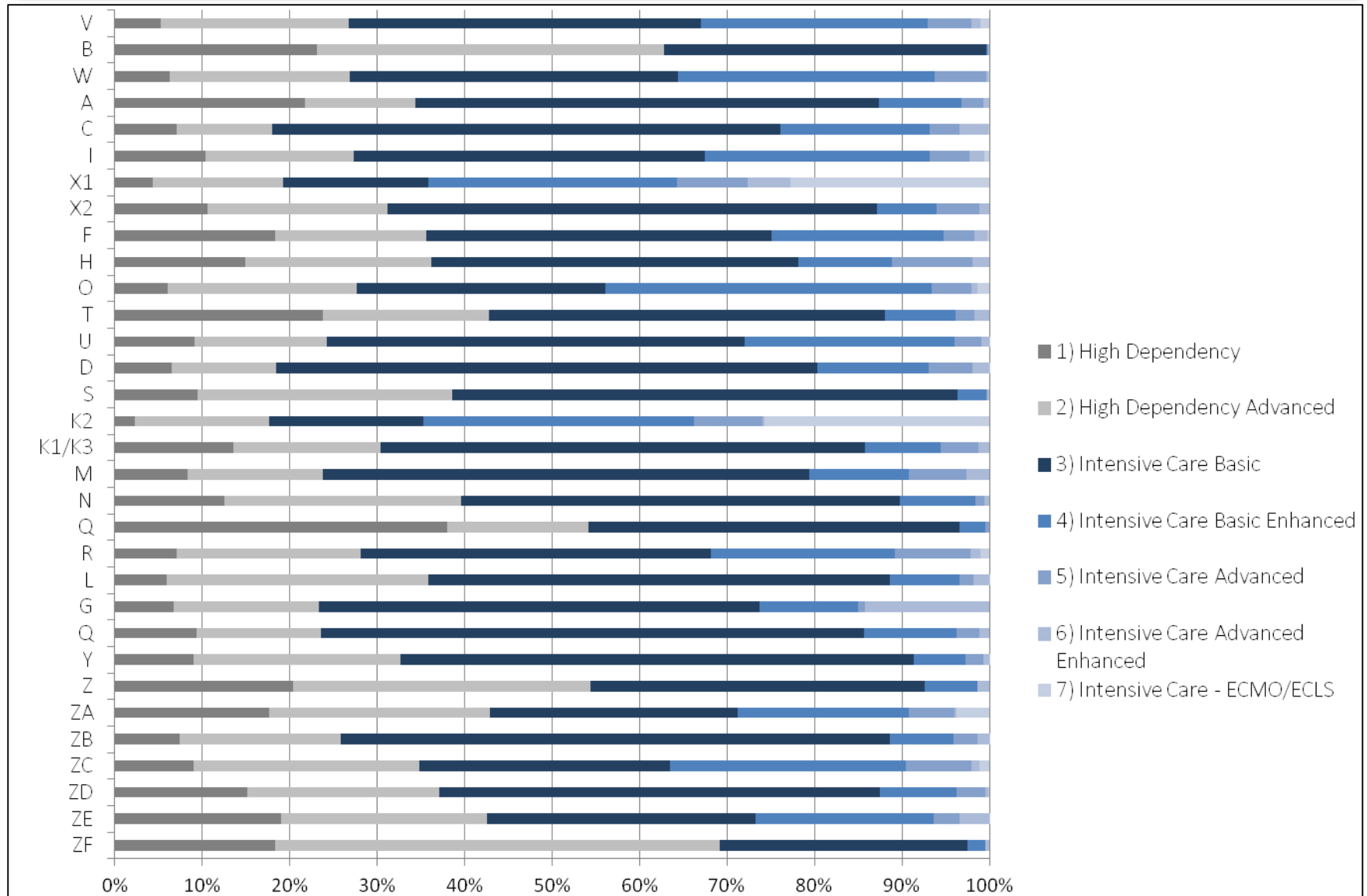
- [Vaccine hope over lung infection](#)
- [Heart ops decision 'risks lives'](#)



Shift of focus to care outside
the ICU

Variation in patient complexity

(% of bed days at each Healthcare Resource Group (HRG) level)



High Dependency Care 2012

similar to where we were for PICU in 1997

- High Dependency Care for children happens in lots of different places – PICUs, adult ICUs, wards (++)
- Same patient may be looked after in ICU in one hospital and on the ward in another (and receive different amounts of funding)
- No clear idea of national numbers
- Staffing skill levels are not consistent
- No clear idea about outcomes

Paediatric Intensive Care “A Framework for the Future”

Report from the National Coordinating Group on
Paediatric Intensive Care to The Chief Executive
of the NHS Executive

... an attempt to move things forward



High Dependency Care for Children - Time To Move On

A focus on the critically ill child pathway beyond
the Paediatric Intensive Care Unit

September 2014

Association of Paediatric Anaesthetists
British Association of General Paediatricians
Faculty of Intensive Care Medicine
Intensive Care Society
NHS England representatives
Paediatric Intensive Care Society
Royal College of Anaesthetists
Royal College of Nursing
Royal College of Paediatrics and Child Health
WellChild

RCPCH
Royal College of
Paediatrics and Child Health
Leading the way in Children's Health

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'Time to move on' - headlines

Alter terminology away from High Dependency and PICU to 'Paediatric Critical Care'

Describes the entire critical care pathway (in and out of PICU)

Three levels of critical care (1,2 and 3)

Level 1 and 2 care describe 'HDU' elements, Level 3 describes PIC

Step up and step down between levels

Develop patient pathways for common problems

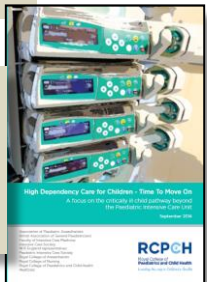
Set higher standards and requirements to deliver Level 2 critical care

Establish Level 2 centres

Establish competency requirements for nursing and medical staff to meet higher expectations to deliver Level 2 critical care

Audit all critical care activity and outcomes, share good practice

Through establishment of paediatric critical care networks



4 years on work in progress

The screenshot shows the NHS England website with a blue header. The top navigation bar includes links for Home, News, Publications, Statistics, Blogs, Events, and Contact us. The NHS England logo is on the left, and a search bar is on the right. Below the header, a secondary navigation bar contains links for About NHS England, Our work, Commissioning, and Get involved. The main content area features a left-hand menu with 'NHS commissioning' and 'Specialised services' highlighted. The 'Specialised services' menu lists: National Programmes of Care and Clinical Reference Groups, Internal Medicine, Cancer, Mental Health, Trauma, and Women and Children. The main content area displays a breadcrumb trail: Home > NHS commissioning > Specialised services > National Programmes of Care and Clinical Reference Groups > Paediatric Critical Care and Specialised Surgery in Children Review. The title 'Paediatric Critical Care and Specialised Surgery in Children Review' is prominently displayed. The introductory text states: 'NHS England launched a national review into paediatric critical care and specialised surgery in children in October 2016. The review is considering paediatric critical care, specialised surgery in children, paediatric critical care transport and extracorporeal membrane oxygenation (ECMO). Though there are [distinct](#)

4 years on work in progress

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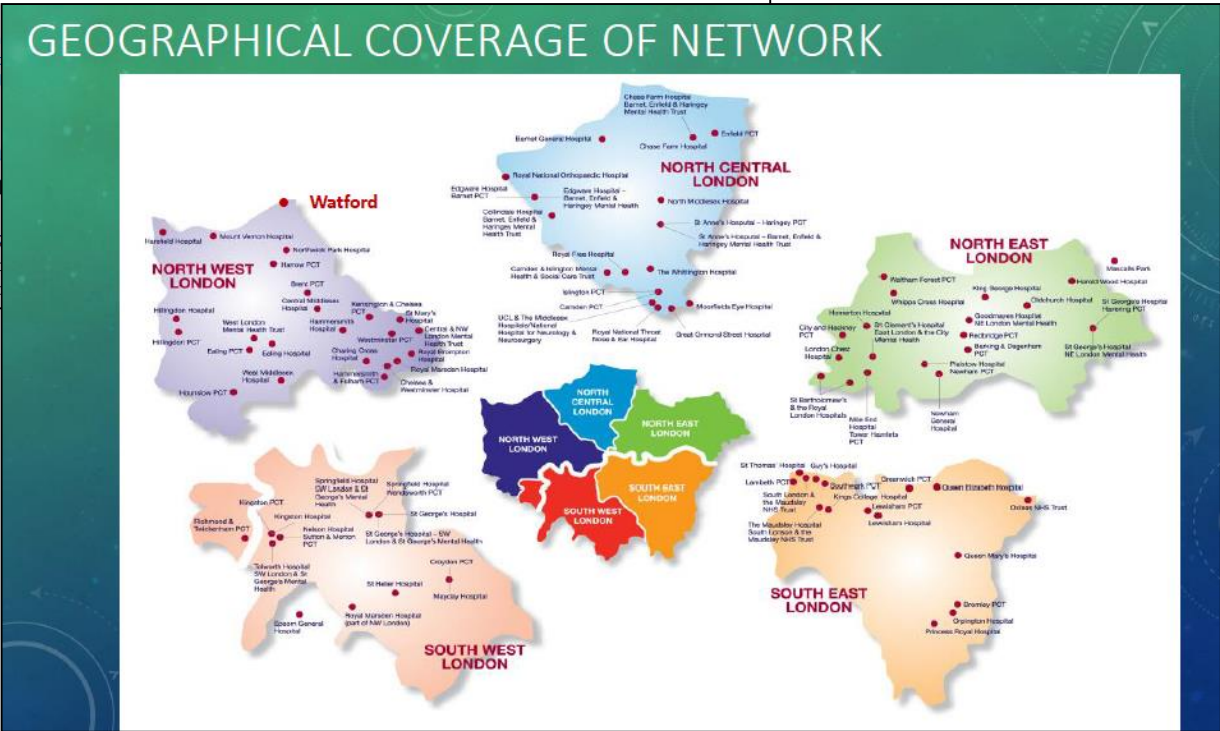
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GEOGRAPHICAL COVERAGE OF NETWORK



UK picture

- Demand for PICU is growing year on year in the UK
- Thresholds for ICU admission vary
- Significant amounts of HDU level care is being delivered in ICUs
- Ability to discharge long stay complex patients also varies
- Provision of improved step-up and step-down critical care facilities should reduce demands on PICU and deliver care closer to home
- Paediatric Critical Care Networks will be key



Complex referral patterns in South East

