



EURO Summer Institute XXIII on “OR in Healthcare”
University of Southampton, UK, 24 July - 5 August 2005

Final report

Summary

ESI XXIII took place at the University of Southampton, UK, between 24 July and August 5, 2005. A total of 35 people from 13 different countries attended the ESI, of whom 19 were sponsored by EURO. There is a long tradition of OR healthcare modelling at the University of Southampton. A unique feature of the Southampton ESI was that the second week ran in parallel with the 31st meeting of the EURO Working Group on OR Applied to Health Services (ORAHS). 48 ORAHS delegates joined the 35 ESI participants, and all ESI participants are now members of ORAHS. In total, in the second week of the ESI there were 83 scientific participants, from 21 countries.

The focus was on applications of OR within the field of healthcare, and within that broad remit there was a variety of papers covering most OR techniques and a range of applications. The 19 EURO-sponsored participants presented their papers in Week 1, and the others presented during Week 2. The ESI papers are currently being considered for a special issue of EJOR.

The meeting was a great success as judged by the feedback, and a good time was had by all. The ESI undoubtedly achieved its aim of enabling the participants to make new friends and academic contacts which will lead to new research and collaboration in the future.

Sponsors

We are most grateful for support from the following ESI XXIII sponsors.



Organising Committee

- Sally Brailsford, University of Southampton, UK (Chair).
- Paul Harper, University of Southampton, UK.
- Chris Potts, University of Southampton, UK.
- Chris Sherlaw-Johnson, University College London, UK.
- Martin Utley, University College London, UK.

Programme Committee

As for the Organising Committee, plus:

- Ruth Davies, University of Warwick, UK.
- Jan Vissers, Eindhoven University of Technology, The Netherlands.
- Marion Rauner, University of Vienna, Austria.
- Vanda de Angelis, University of Rome, Italy.
- Mike Carter, University of Toronto, Canada.

Keynote Speakers (Week 1)

Ed Kaplan from Yale had initially agreed to be a keynote speaker, but withdrew for political reasons and Yasar Ozcan from Virginia Commonwealth University, USA, kindly agreed to step in at short notice. The speakers were:

Monday: Theme: Introduction to OR Models for Health: Yasar Ozcan

Professor, Department of Health Administration, School of Allied Health Professions, Virginia Commonwealth University, USA.

Tuesday: Theme: Analytical and Mathematical Models: Steve Gallivan

Professor, Clinical Operational Research Unit, University College London, UK.

Wednesday: Theme: Simulation Modelling: Ruth Davies

Professor of OR and Systems, Operational Research and Information Systems Group, Warwick Business School, University of Warwick, UK.

Thursday: Theme: Optimisation: Mike Carter

Professor, Healthcare Resource Modeling Laboratory, Mechanical & Industrial Engineering, University of Toronto, Canada.

Friday: Theme: Operations Management: Jan Vissers

Professor of Health Operations Management, Institute for Health Policy and Management, Erasmus Medical Centre Rotterdam and Department of Technology Management, Eindhoven University of Technology, The Netherlands.

Each day started with a 90-minute tutorial by the keynote speaker, each of whom is an international expert in their area, followed by four or five 45-minute presentations from the EURO-funded participants. The keynote speaker led the subsequent discussions and gave advice on improving the submitted papers. The other participants presented shorter papers in Week 2 as part of ORAHS but were able to benefit from the detailed in-depth discussion of the ESI papers. A full programme of both weeks is attached as an Appendix.

Social events during week 1 included a welcome party, games of rounders and football, a skittles evening, a very wet afternoon orienteering in the New Forest, a pub crawl round Southampton City Centre and a party at Sally and Chris's house on the Friday evening. On the middle Saturday, the ESI participants had a day trip to the Isle of Wight.

ESI Participants

First name	Family name	Country	Funding
Revlín	Abbi	UK	Self
Carla	Amado	Portugal	EURO
Jack	Baber	UK	Self
Luciano	Brandao de Souza	UK	Self
Maria	Bruni	Italy	EURO
Red	Cegłowski	Australia	Self
Anthony	Codrington-Virtue	UK	Self
Alexandre	Duarte	Brazil	EURO (ALIO)
Zuzana	Figlova	Czech Republic	EURO
Murat	Gunal	UK	Self
Erwin	Hans	Netherlands	EURO
Rim	Kalai	France	EURO
Korina	Katsaliaki	UK (Soton)	Self
Saeedeh	Ketabi	Iran	EURO (IFORS)
Renata	Kopach	Canada	CORS
Markus	Kraus	Austria	EURO
Beste	Kucukyazici	Canada	CORS
Niki	Kunene	USA	EURO (IFORS)
Mehdi	Lamiri	France	EURO
Zoe	Lawson	UK	Self
Evandro	Leite	UK (Soton)	Self
Nelly	Litvak	Netherlands	EURO
Monica	Oliveira	Portugal	EURO
Brijesh	Patel	UK	EURO
Suchi	Patel	UK	EURO
Nguyen	Pham	Switzerland	EURO
Naomi	Powell	UK (Soton)	Self
Naomi	Price-Lloyd	UK	Self
Linda	Salustri	Italy	EURO
Paola	Sbandi	Italy	EURO
Honora	Smith	UK (Soton)	Self
Jenni	Sykes	UK (Soton)	Self
Gerhard	Wullink	Netherlands	Self
Iryna	Yevseyeva	Finland	EURO
Wolfgang	Zeppelzauer	Austria	EURO

The two Canadian participants were generously supported by the Canadian OR Society, CORS. Funding from the UK OR Society, the Southern OR Group (the local regional society of the OR

Society) and the Network for Modelling and Simulation in Healthcare (MASHNet), together with support from the UK's Engineering and Physical Sciences Research Council enabled us to offer a subsidy to the UK delegates. We are very grateful for the generosity of these organizations. Health OR is a major strength in the UK and this was borne out by the number of UK participants wishing to attend.

The School of Management provided the venue free of charge. The presentations took place in the high-quality surroundings of the Management Lecture Theatre, normally used for MBA teaching.

Evaluations

Rated on a scale of 1.. 5, where 1 = poor and 5 = outstanding.

Meeting as a whole	4.88		
Pre-meeting planning	4.89	Usefulness of documentation	4.33
Welcome & registration	4.89	Usefulness of website	4.29
Overall organisation	4.89	Quality of venue	4.44
Quality of papers	4.00	Quality of food & refreshments	4.33
Effectiveness for making contacts	4.44	Quality of accommodation	3.33

The rather low mark for accommodation was probably because we used a student residence, which was fairly basic. We feel EURO should be aware that it is no longer cheap to use many student residences during the summer vacation, certainly in the UK, since universities regard this as an income stream (for conferences or language schools) and charge very high rates for the more comfortable accommodation. The residence did not supply bedding or tableware and I had to purchase 29 sets of duvets, pillows and sheets! We were fortunately able to donate these to a worthy cause after the ESI; the Southampton Refuge for women and children fleeing domestic violence.

Photographs



Yasar Ozcan showing his skills at rounders



Everyone enjoying a pub meal after the match



Very wet orienteers (thanks to Wolfgang Zeppelzauer for the photo)



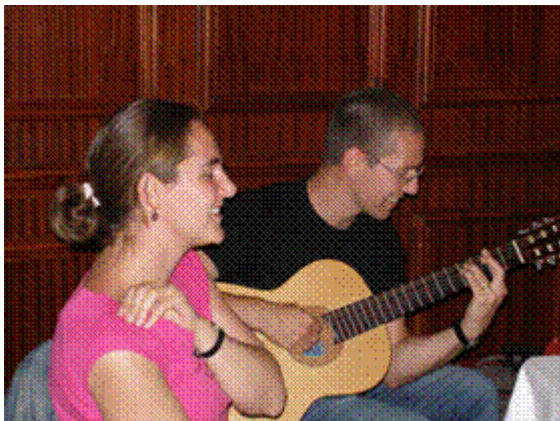
The party on Friday night



Chinese meal in week 2



HMS Victory – the Wednesday trip



ESI participants with musical talents



The banquet at St Mary's Football Stadium (thanks to Suchi Patel for the photo)

Many more photographs can be seen at <http://esisphotos.fotopic.net>. Many thanks to Erwin Hans, the guitarist above, for organizing this website.

The whole fortnight was totally exhausting but the most tremendous fun. I would like to thank all the organizing committee, in particular Paul Harper, whose many talents include the ability to carry large numbers of duvets up and down several flights of stairs (not part of the academic job description!) and Charlotte Rugby from the School of Management, whose organizational skills and hard work behind the scenes helped make the two week marathon go amazingly smoothly. The strong contingent of Southampton health OR PhD students also provided much valuable help with the social events and countless other odd jobs – many thanks to all of you.

Sally Brailsford
September 2005

Scientific Programme Schedule

Monday 25th July

09.00 – 10.30	Keynote Theme: Introduction to OR Models for Health Yazar Ozcan Professor, Department of Health Administration, School of Allied Health Professions, Virginia Commonwealth University, USA.
10.30 – 11.00	Coffee
11.00 – 13.00	Session MO1 <ul style="list-style-type: none">• Carla Amado: Comparing the Performance of Primary Care Providers: A New Conceptual Framework• Niki Kunene: An Approach for Predicting and Describing Patient Outcome Using MCDA and AI Methods Representational Methods in the Study of Traumatic Brain Injury Patients
13.00 – 14.00	Lunch
14.00 – 15.00	Session MO2 <ul style="list-style-type: none">• Nelly Litvak: Managing the Overflow of Intensive Care Patients
15.00 – 15.30	Tea
15.30 – 16.30	Session MO3 <ul style="list-style-type: none">• Iryna Yevseyeva: Verbal Ordinal Classification With Multicriteria Decision Aiding

Tuesday 26th July

09.00 – 10.30	Keynote Theme: Analytical and Mathematical Models Steve Gallivan Professor, Clinical Operational Research Unit, University College London, UK.
10.30 – 11.00	Coffee
11.00 – 13.00	Session TU1 <ul style="list-style-type: none">• Maria Bruni: An Integrated Chance Constrained-Two-Stage Model for the Design of Emergency Medical Services• Zuzana Fíglová: Utilization of Inpatient Services in the Region of South Bohemia, the Czech Republic
13.00 – 14.00	Lunch
14.00 – 15.00	Session TU2 <ul style="list-style-type: none">• Saeedeh Ketabi: Waiting Time and the Corresponding Factors on Reducing the Delay in Hospital Elective Procedure
15.00 – 15.30	Tea
15.30 – 17.30	Session TU3 <ul style="list-style-type: none">• Mónica Oliveira: Modelling the Redistribution of Hospital Supply to Achieve Equity Taking Account of Patient's Behaviour• Wolfgang Zeppelzauer: A Taxonomy for Coronary Heart Disease Policy Models

Wednesday 27th July

09.00 – 10.30	Keynote Theme: Simulation Modelling Ruth Davies Professor of OR and Systems, Operational Research and Information Systems Group, Warwick Business School, University of Warwick, UK.
10.30 – 11.00	Coffee
11.00 – 13.00	Session WD1 <ul style="list-style-type: none">• Linda Salustri/Paola Sbandi: Modelling and Simulating the Processes of an Accident and Emergency Department• Suchi Patel: Issues Related in the Development of Sub-Models to be Implemented Within a Discrete Event Simulation Model
13.00 – 14.00	Lunch

Thursday 28th July

09.00 – 10.30	Keynote Theme: Optimisation Mike Carter Professor, Healthcare Resource Modeling Laboratory, Mechanical & Industrial Engineering, University of Toronto, Canada.
10.30 – 11.00	Coffee
11.00 – 13.00	Session TH1 <ul style="list-style-type: none">• Alexandre Duarte: Graph Matching Algorithms for Scene Recognition in Medical Imagery• Erwin Hans: Robust Surgery Loading
13.00 – 14.00	Lunch
14.00 – 15.00	Session TH2 <ul style="list-style-type: none">• Rim Kalai: Minmax Regret 1-Center Problem on a Network with a Discrete Set of Scenarios
15.00 – 15.30	Tea

15.30 – 17.30	<p>Session TH3</p> <ul style="list-style-type: none"> • Nguyen Pham: Surgical Case Scheduling as Generalized Job Shop Scheduling Problems • Renata Kopach: Tutorial on Constructing a Red Blood Cell Inventory Management System with Two Demand Rates
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Friday 29th July

09.00 – 10.30	<p>Keynote</p> <p>Theme: Operations Management</p> <p>Jan Vissers</p> <p>Professor of Health Operations Management, Institute for Health Policy and Management, Erasmus Medical Centre Rotterdam and Department of Technology Management, Eindhoven University of Technology, The Netherlands.</p>
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10.30 – 11.00	Coffee
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11.00 – 13.00	<p>Session FR1</p> <ul style="list-style-type: none"> • Burcu Ersöz: Hospital Workflow Management: a Case Study • Markus Kraus: Internet-based Multiple Hospital Management Game: The Concept
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13.00 – 14.00	Lunch
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14.00 – 15.00	<p>Session FR2</p> <ul style="list-style-type: none"> • Mehdi Lamiri: A Stochastic Model for Operating Room Planning with Elective and Emergency Surgery Demands
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15.00 – 15.30	Tea
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15.30 – 16.30	<p>Session FR3</p> <ul style="list-style-type: none"> • Brijesh Patel: Balancing the NHS Balanced Scorecard!
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Monday August 1st

09.30 – 10.00	Registration and coffee
10.00 – 12.00	<p>Welcome from the Conference Chair Sally Brailsford – <i>School of Management, University of Southampton</i></p> <p>Paul Harper – <i>School of Mathematics, University of Southampton</i> A brief history of healthcare modelling at Southampton</p> <p>Keynote Talks Chair: Sally Brailsford</p> <p>David Paynton – <i>Chair Professional Executive Committee Southampton City Primary Care Trust</i> Computer modelling - a bag of tricks or useful dynamic tool?</p> <p>Simon Dodds – <i>Consultant Vascular Surgeon, Good Hope Hospital NHS Trust</i> Designing improved healthcare processes - two heads are better than one!</p>
12.00 – 13.00	Lunch
13.00 – 15.00	<p>Keynote Talks Chair: Paul Harper</p> <p>Geoff Royston – <i>Head of Operational Research, Department of Health</i> OR contributions to health sector strategy, policy and delivery in the UK: past achievements and future challenges.</p> <p>David Bensley – <i>Operational Research Programme Manager, Department of Health</i> Evaluation of a flagship whole hospital system change programme for service improvement: methodologies, results and wider applicability.</p> <p>Martin Pitt – <i>Peninsula Technology Assessment Group, Peninsula Medical School, Universities of Exeter and Plymouth</i> MASHnet - Creating the context for successful implementation of modelling and simulation in health.</p>
15.00 – 15.30	Tea
15.30 – 17.00	<p>Session 1: Logistics and Supply Chain Management Chair: Jeff Griffiths</p> <ul style="list-style-type: none"> • Dave Worthington: Operational Research modelling to support healthcare operations management • Korina Katsaliaki: The supply chain management of blood in the United Kingdom • Tobias Andersson: Decision support for efficient ambulance logistics

Tuesday August 2nd

<p>09.00 – 10.30</p> <p>Session 2A in Lecture Room 3043</p> <p>Session 2B in Lecture Theatre K (level 1)</p>	<p>Session 2A: People Issues: Patients and Staff</p> <p>Chair: Ruth Davies</p> <ul style="list-style-type: none"> Marc Haspelagh: Staff allocation on the basis of competence: the case of the competence of psychiatric nurses caring for depressed patients in Belgium in 2005 Penny Mullen: Choice OR Choice Mario Vanhoucke: NSPLib – A Nurse Scheduling Problem Library: a tool to evaluate (meta-) heuristic procedures 	<p>Session 2B: Serious Illness and Comprehensive Health</p> <p>Chair: Mario Jorge Oliveira</p> <ul style="list-style-type: none"> Naomi Price-Lloyd: Modelling a Critical Care Directorate Arjan Shahani: Capacity and organisation of High Dependency care in a hospital Arjan Shahani: Ayurveda: Indian knowledge for comprehensive health
<p>10.30 – 11.00</p> <p>Coffee</p>		
<p>11.00 – 12.30</p> <p>Session 3A in Lecture Room 3043</p> <p>Session 3B in Lecture Theatre K (level 1)</p>	<p>Session 3A: Quality and Performance Measurement</p> <p>Chair: Penny Mullen</p> <ul style="list-style-type: none"> Marcos Lins: Assessment of teaching hospitals performance using the interactive data envelopment analysis laboratory IDEAL Luc Delesie: Deciding on total hip prosthesis centre (decision-making by patients) Martin Dlouhy: Production functions in health care: modelling techniques and their problems 	<p>Session 3B: Capacity Planning and Management 1</p> <p>Chair: Dave Worthington</p> <ul style="list-style-type: none"> Kathy Taylor: Modelling the feedback effects of reconfiguring health services Jack Baber: Hospital theatre utilisation modelling Roberto Prottil: Increasing the occupation rate at the Surgical Center of the Hospital Universitário Cajuru using computational simulation
<p>12.30 – 13.30</p> <p>Lunch</p>		
<p>13.30 – 15.00</p> <p>Session 4: Disease Models 1</p> <p>Chair: Arjan Shahani</p> <ul style="list-style-type: none"> Adrian Bagust: Assessing the effects of lifetime treatment strategies for glycaemic control in type 2 diabetes with a long term metabolic model of disease progression Marion Rauner: A combined discrete-event simulation and ant colony optimisation approach for selecting optimal screening policies for diabetic retinopathy Chris Sherlaw-Johnson: The development and use of monitoring tools for hospital-acquired infection 		
<p>15.00 – 15.30</p> <p>Tea</p>		
<p>15.30 - 17.00</p> <p>Session 5: Emergency Department Models</p> <p>Chair: John Blake</p> <ul style="list-style-type: none"> Red Ceglowski: Unravelling patient treatment processes in a hospital Emergency Department Tony Codrington-Virtue: Developing an application of an Accident & Emergency patient simulation modelling using an interactive framework Vanda de Angelis: Modelling and simulating the processes of an Accident and Emergency Department 		

Thursday August 4th

<p>09.00 – 10.30</p> <p>Session 6A in Lecture Room 3043</p> <p>Session 6B in Lecture Theatre K (level 1)</p>	<p>Session 6A: Community Care Chair: Christos Vasilakis</p> <ul style="list-style-type: none"> • Tom Bowen: Modelling the potential for Telecare and Telemedicine • Naomi Powell: Modelling a rehabilitation team with a view to optimising the competencies of the different members of the workforce • Colin Thunhurst: The ORCHID project - using Operational Research to build partnerships for community health development 	<p>Session 6B: Access and Service Quality Chair: Jan Vissers</p> <ul style="list-style-type: none"> • Peter van Berkel: Improving access to quality health care - an application in general surgery • Beste Kucukyazici: Using Markov modelling to understand, assess and improve the community-based care delivery process for stroke • Mario Jorge Oliveira: An evaluation of the managed care concept as applied to the Brazilian supplementary health service
<p>10.30 – 11.00 Coffee</p>		
<p>11.00 – 12.30</p> <p>Session 7A in Lecture Room 3043</p> <p>Session 7B in Lecture Theatre K (level 1)</p>	<p>Session 7A: Capacity Planning and Management 2 Chair: Steve Gallivan</p> <ul style="list-style-type: none"> • John Blake: Waitlist management - issues, models and applications • Christos Vasilakis: Individual vs. centralized clinic appointment wait list: computer simulation experiments • Jan Vissers: Simulation of patient flows in a mental health care setting: a case study 	<p>Session 7B: Management and Funding Systems Chair: Marten Lagergren</p> <ul style="list-style-type: none"> • Eriks Mikitis: Do the changes in patient's co-payment system make the difference in hospital service? • Murat Gunal: Performance assessment of hospitals by using simulation • Marek Lubicz: Modelling healthcare financing system in action: current issues, classifications, priorities and allocation – a case study: hospital care system at Lower Silesia in Poland
<p>12.30 – 13.30 Lunch</p>		
<p>13.30 – 15.00</p>	<p>Session 8: Disease Models 2 Chair: Marion Rauner</p> <ul style="list-style-type: none"> • Martin Utley: Can patient progress modelling inform the management of cancer patients? • Zoe Lawson: Modelling treatment effects in the HIV/AIDS epidemic • Jenni Sykes: Behavioural healthcare modelling 	
<p>15.00 – 15.30 Tea</p>		
<p>15:30 – 17.00</p>	<p>Session 9: Optimising the Use of Facilities Chair: Mike Carter</p> <ul style="list-style-type: none"> • Xiaolan Xie: A stochastic model for operating room planning with elective and emergency surgery demands • Marie Persson: Optimization modelling of hospital Operating Room planning - analyzing strategies and problem settings • Steve Gallivan: Scheduling outpatient clinics, a rooks tour and the Birkhoff von Neumann theorem 	

Friday August 5th

09.30 – 11.00	Session 10: Organisational Issues Chair: Martin Pitt <ul style="list-style-type: none"> • Gerhard Wullink: A typology of health care organizations for Hospital Planning and Control (HPC) • Barry Shaw: Managing a hospital ward: identifying cost-effective strategies • Marten Lagergren: Dependency development and transfer to institutional care – cause or effect?
11.00 – 11.30	Coffee
11.30 – 12.30	ORAHS Working Group Business Meeting
12.30 – 13.30	Lunch and Departure

Social Schedule

Sunday 24 th July	Welcome Party and Registration (ESI) Meeting Room, School of Management
Monday 25 th July	Rounders and Football game Southampton Common – followed by meal in local pub
Tuesday 26 th July	Pub Meal and Skittles Evening St Denys Pub, Southampton
Wednesday 27 th July	Orienteering in the New Forest Followed by more skittles and another pub meal!
Thursday 28 th July	Pub crawl Led by Southampton PhD students
Friday 29 th July	Party At Sally and Chris's – all welcome
Saturday 30 th July	Trip to Isle of Wight
Sunday 31 st July	Welcome Party and Registration (ORAHS) Senior Reading Room, School of Mathematics – for all
Monday 1 st August	Civic Reception City Art Gallery (Civic Centre) – attended by Mayor of Southampton Followed by Chinese dinner.
Tuesday 2 nd August	Pub Meal and Skittles Evening in the New Forest For ORAHS only – ESI pizza evening
Wednesday 3 rd August	Field Trip and Social Outing Visit to Royal Hampshire County Hospital, Winchester. Lunch at Gunwharf Quays, Portsmouth. Tour of Portsmouth Historic Dock Yard (HMS Victory, Mary Rose etc) and boat trip round Portsmouth Harbour Evening meal in country hotel near Arundel
Thursday 4 th August	Conference Dinner St. Mary's Football Stadium, Southampton

