frontline
we help you do things better

By email to:
Gordon.French@eastmidlands.nhs.uk
Richard.Marriott@eastmidlands.nhs.uk
Bryn.Baxendale@nuh.nhs.uk

Dr Gordon French
Deputy Postgraduate Dean
Director of Secondary Care (South Centre)
East Midlands Healthcare Workforce Deanery
Rutland House
11 Merus Court
Meridian Business Park
Leicester
LE19 1RJ

EA2404-00

7 April 2010

Dear Gordon

Review of Simulation-based Education in the East Midlands – Report

I am pleased to enclose the report on Frontline's review of simulation-based education across the East Midlands. This reflects the comments of the Project Board on our draft, and our subsequent follow-on discussions with stakeholders.

I would be pleased to provide any further background to our findings and recommendations as you discuss these further with your colleagues across East Midlands.

Kind regards.

Yours sincerely

John Deffenbaugh
Director

Frontline Consultants
9 Staple Inn, Holborn, London, WC1V 7QH
T: 0207 404 7005 F: 0207 404 8010 E: consult@frontlinemc.com
www.frontline-consultants.com
Also at Willow House, Strathclyde Business Park, Lanarkshire, ML4 3PB

Review of Simulation-Based Education in the East Midlands

Report for

East Midlands Healthcare Workforce Deanery

frontline

we help you do things better

Review of Simulation-based Education in the East Midlands

Report for East Midlands Healthcare Workforce Deanery

Contents **Page**

Executive Summary

Background

Simulation as an educational technique is being used with increasing frequency within healthcare in recent years. Simulation training offers healthcare professionals the opportunity to develop skills and hone competencies in areas of clinical practice in circumstances that reduce the risk to patients. Providing a 'safe' virtual environment allows healthcare professionals to make, and learn from, mistakes and to learn and rehearse best practice. This in turn improves their competence if, or when, confronted with similar situations where the competencies developed are required.

There is an increasing, yet still emerging, body of evidence showing the value of simulation in developing staff competencies, leading to increased patient safety. Faced with this growing evidence and increasing use of simulation, there has been an increasing push to develop coordinated policies and processes at national and regional levels. It is important to ensure that simulation-based education is available and is delivering the highest possible returns in the education of healthcare staff and towards the safety of patients.

Within East Midlands, simulation has developed incrementally throughout a range of healthcare organisations. However, there is scope for much greater coordination of these resources at a regional level, with a variety of different approaches to incorporating simulation-based education and establishing simulation facilities being adopted by the range of healthcare organisations across the region. East Midlands Healthcare Workforce Deanery (EMHWD) therefore wished to develop a strategy for maximising the benefits of simulation-based education within the region.

Review

To inform the strategy, Frontline was commissioned to carry out a strategic review of what simulation-education and facilities are available, how they are accessed and managed, and what could be done to improve the future provision of simulation in East Midlands. This was achieved by consultation with over 80 stakeholders, through a combination of face-to-face meetings, telephone interviews, a focus group of trainees, and an e-survey of simulation stakeholders, which achieved a 62% response rate.

Findings

Findings from consultation with stakeholders across East Midlands confirmed that there is an extremely wide range of simulation-based activities occurring throughout dedicated simulation facilities, and within the workplace. Findings suggest that simulation is currently provided across all sub-regions, but provision could be coordinated more effectively at a regional level to provide consistency of provision and to prioritise access among healthcare professionals.

A key point emerging from the consultation was that accessibility is key. There are a diverse range of barriers which must be overcome to increase accessibility across East Midlands, including:

- limited faculty time and resources to train staff to deliver simulation
- limited time and resources to allow trainees to attend simulation-based training
- financial constraints limiting the provision of simulation equipment and facilities

All of which must be prioritised against other demands on limited resources.

Findings also suggest that within current provision, there is less availability of high fidelity simulation at a regional level, with medium and low fidelity simulation being more easily accessed locally. Most stakeholders suggest, however, that the key to increasing accessibility is a balance of dedicated simulation facilities, including more local resources which could be more easily accessed and shared across providers through network engagement. The way ahead for the East Midlands is therefore to develop further a 'distributed' model of simulation provision around greater integration of current facilities, and development of a wider range of facilities located close to the level of patient interaction.

In terms of who can access simulation, findings show that there is limited capacity to meet the needs of all staff in their use of all types of simulation-based training. Again, accessibility is key, and decisions need to be made to prioritise access for healthcare professionals, where simulation training is most likely to impact upon patient safety. Findings also suggest that inter-professional and team-based learning is being seen as increasingly important, with the interaction between different healthcare professionals being increasingly recognised as a key factor of improved clinical practice, and a means to enhancing patient safety. The challenge for East Midlands will be to prioritise access where it will be most beneficial, and to maximise staff engagement to deliver maximum benefits in patient safety.

Coordination of provision is also key to maximising facilities and training opportunities, for both faculty and trainees. To enable coordinated delivery, there must also be coordinated training of trainers – ensuring that a cadre of simulation faculty is available to support the training needs of trainees, and to ensure that quality standards are met throughout the region by providing a consistent experience for both faculty and trainees. Job plans should therefore be structured to enable the required level of training for faculty and the provision of training itself.

Finally, findings from consultation and research suggest that developing the evidence base of the impact of simulation will be essential in generating buy-in and support for both maintaining and enhancing investment. The findings themselves suggest that simulation is positively perceived, and viewed as having a beneficial impact; however, the more clearly this is articulated, and the more clearly benefits can be linked to patient safety, the more willing commissioners will be to invest in simulation. Developing the evidence base, and generating commissioner buy-in, will therefore be key to developing simulation provision within East Midlands.

Recommendations

The findings presented in this review therefore highlight the key issues around the current and future provision of simulation within East Midlands, leading to the following recommendations:

- Develop a distributed model of simulation provision across East Midlands to maximise the benefit of the current centrally-located facilities and the still developing locally-focused facilities
- The Deanery should consider how to access resources that may be required for pump priming of the more feasible business cases put forward by developers and users
- Maximise the opportunity for enhancing patient safety through prioritising simulation access for newly qualified healthcare practitioners
- Prioritise further simulation opportunities to develop teamwork at a work-based level
- Include reasonable simulation provision in job plans, and recognise its contribution to patient safety and reduced risk to trust service provision
- Agree the baseline level of consistency for faculty, facilities and processes vis-à-vis simulation across East Midlands and aspirations for continuous improvement
- Establish a network across East Midlands to maximise the use of simulation-based education facilities, linking into improved clinical skills training, and consider the role of the Deanery in leveraging this development
- The Deanery to take the lead in working with providers to put in place a research infrastructure that delivers further evidence of impact
- The Deanery to reflect these review findings in its strategy to inform prioritisation and decision making

The conclusions and recommendations drawn from these findings will inform the development of a productive strategy for simulation in East Midlands being developed by EMHWD illustrating key steps which should be taken to improve simulation practices in the region for the benefit of patients.

1 Introduction and Overview

This report presents the findings and recommendations from Frontline's review of simulation-based education in the East Midlands. The review was commissioned by the East Midlands Healthcare Workforce Deanery (EMHWD) with the aim of providing an independent perspective to establish what simulation-based educational facilities and equipment are available within the East Midlands, and what, if any, improvements may be required.

We carried out our review at a strategic level, rather than a detailed audit as originally envisaged, recognising that our findings would contribute substantively to developing the EMHWD strategy for simulation provision in the East Midlands.

As background to the review, a number of external factors are apparent that will shape the development of simulation in the East Midlands, including:

- draft findings of the **Department of Health** *NHS Simulation Provision and Use Study* – providing the national picture of simulation provision across England, within which East Midlands can develop its strategy
- NHS **efficiency savings** target of between £15-20b – providing the framework for the availability and allocation of future resources and the necessity for their effective use
- report of the independent inquiry into care provided by Mid-Staffordshire NHS Foundation Trust – placing **patient safety** at the top of every board agenda
- strategic focus on **QIPP** (Quality, Innovation, Productivity, Prevention) – providing a decision making framework for the prioritisation of resources

There are, of course, many other factors that need to be taken into account in considering this issue, but the strategic ones were universally highlighted during the course of our review as significantly impacting on future simulation provision.

The Deanery is developing its simulation strategy in a fluid and changing environment. Much has happened over recent years, and considerable resources are in place. Our task, therefore, has been to take stock – from a strategic perspective – of the current position as a means of informing the way forward. The next section presents our methodology for carrying out the review.

2 Review Methodology

The review was a short, sharp initiative carried out over February and March 2010. The activities underpinning our fact finding analysis included:

- **stakeholder survey** – beginning with an initial list of 29 stakeholders, this increased to 128 questionnaires distributed, of which we achieved an 62% response rate
- **telephone interviews** – 12 telephone interviews carried out with stakeholders to gather further insight to questionnaire findings
- **face-to-face meetings** – 7 interviews were carried out on-site to both explore findings and gain further insights, and to view simulation facilities
- **focus group** – held with a group of trainee anaesthetists to gain 'customer' perceptions on simulation provision

We were struck by the receptiveness and openness of stakeholders across East Midlands to engage in this review. The level of response to our questionnaire at 62% compares markedly with the 12% obtained through the national survey. We did, however, benefit from the experience of this national project, since it enabled us to tailor our methodology and questionnaire to build on earlier work, and to avoid duplication and repetition.

Core to the questionnaire design was an agreed range of simulation types that became a common thread through the survey. Building on the experience of both the Deanery and Frontline, we agreed the following **simulation types**:

- table top paper-based simulations
- role playing by learners
- use of live simulators or actors
- specific task or procedural training devices
- advanced computer-driven full body mannequins
- computer screen-based simulations

Our findings and recommendations for the way forward were tested out during the course of the review with a small steering group set up by the Deanery. We also took into account the strategy outline prepared by the Deanery, so that our work dovetails effectively with this.

Against this background, we present our review findings in the following sections.

3 Stakeholder Profile

Knowing the individuals who are responsible for commissioning, managing and delivering simulation-based education in the East Midlands is essential to developing a strategy which delivers future improvements in education and patient safety. The knowledge of these stakeholders must be used to provide a robust understanding of the simulation activity currently taking place, and to make informed decisions about how simulation-based education must be supported, delivered, and developed in the future.

From the outset of this review, we have worked with specialists to populate a database of key stakeholders of simulation-based education within the East Midlands. Beginning with a core list of 29 stakeholder organisation, this expanded up to 128 individuals who received the questionnaire. This database can of course be expanded further, since we anticipate that it will be an on-going resource to be used to support communications with stakeholders and generate a continuous dialogue regarding the development of simulation activities in the East Midlands.

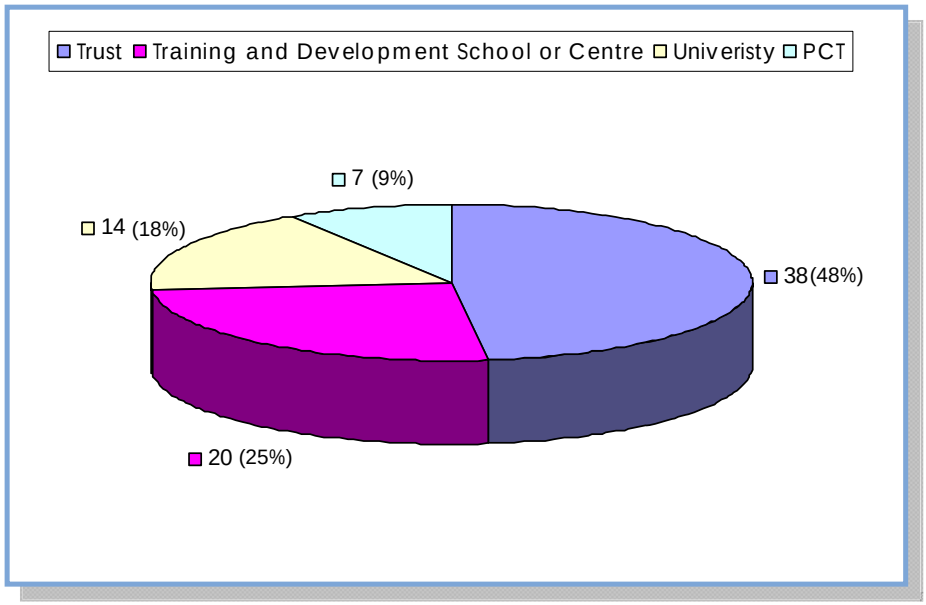
Of the 128 stakeholders who were contacted, using the stakeholder database, 79 individuals (62% of the total) responded to the review questionnaire, which asked for views on the current provision and future development of simulation-based education. The results provided by these 79 respondents are not only helpful in highlighting current and future issues, but also provide a picture of the distribution of stakeholders across the East Midlands. The respondents represent healthcare organisations throughout the East Midlands, as summarised below in Table 3.1.

Organisations responding to survey **Table 3.1**

Name Of Organisation	No. of survey responses	Name Of Organisation	No. of survey responses
Trusts		**Universities**	
University Hospitals of Leicester NHS Trust	13	University of Northampton	5
Nottingham University Hospitals NHS Trust	9	University of Nottingham	4
Northampton General Hospitals NHS Trust	4	University of Derby	2
Leicester Partnership NHS Trust	3	University of Leicester	2
United Lincolnshire Hospitals NHS Trust	2	University of Lincoln	1
Derbyshire Mental Health Services NHS Trust	1	**Training and development schools and centres**	
Chesterfield Royal Hospital NHS Foundation Trust	1	East Midlands Healthcare Workforce Deanery, including speciality and foundation schools	17
Kettering General Hospitals NHS Trust	1	Trent Simulation & Clinical Skills Centre	2
Sherwood Forest Hospitals NHS Foundation Trust	1	Montagu Clinical Simulation Centre – Yorkshire and the Humber	1
East Midlands Ambulance Service NHS Trust	1	**Primary Care Trusts**	
Lincoln Partnership Foundation Trust	1	NHS Lincolnshire	2
Derby Hospitals NHS Foundation Trust	1	Derby County PCT	2
		NHS Nottinghamshire County	1
		NHS Northamptonshire	1
		NHS Leicester County and Rutland	1

The overall analysis of these stakeholders by key segment is shown in Figure 3.1 below.

Segmentation of respondents **Figure 3.1**



This analysis shows that the largest number of responses to the e-survey came from individuals based in trusts within East Midlands. This may be unsurprising, as trusts are closely involved in the training of post-graduate staff and the delivery of simulation-based education to these trainees.

Reponses from training and development schools and centres make up the second largest respondent group. The high proportion of responses from this group might be expected given their interest in the education agenda. The vast majority of these responses came from EMHWD; however, other responses came from centres specialising in simulation, such as the Trent Simulation and Clinical Skills Centre.

As the focus of the review was on the use of simulation training for post-graduate staff, the universities were engaged to a lesser extent than might otherwise have been the case if emphasis had been placed on the use of simulation to train under-graduates. There was nevertheless a reasonable response from universities within East Midlands.

Primary care trusts may be further removed from the actual delivery of simulation-based training, acting in a commissioning or strategic capacity, and therefore response numbers from this group were lower. Nevertheless, responses were received from four of the nine PCTs within East Midlands, giving insight into the commissioner perspective.

Responses were received from across the East Midlands sub-regions, and a breakdown of the number of response from each sub-region is presented in Table 3.2 below (these figures exclude responses which did not detail the geographical location of their organisation, or organisations which covered multiple regions).

Responses by sub-region **Table 3.2**

Sub-Region	Number of Respondents
Leicestershire and Rutland	21
Nottinghamshire	16
Northants	10
Derbyshire	7
Lincolnshire	6

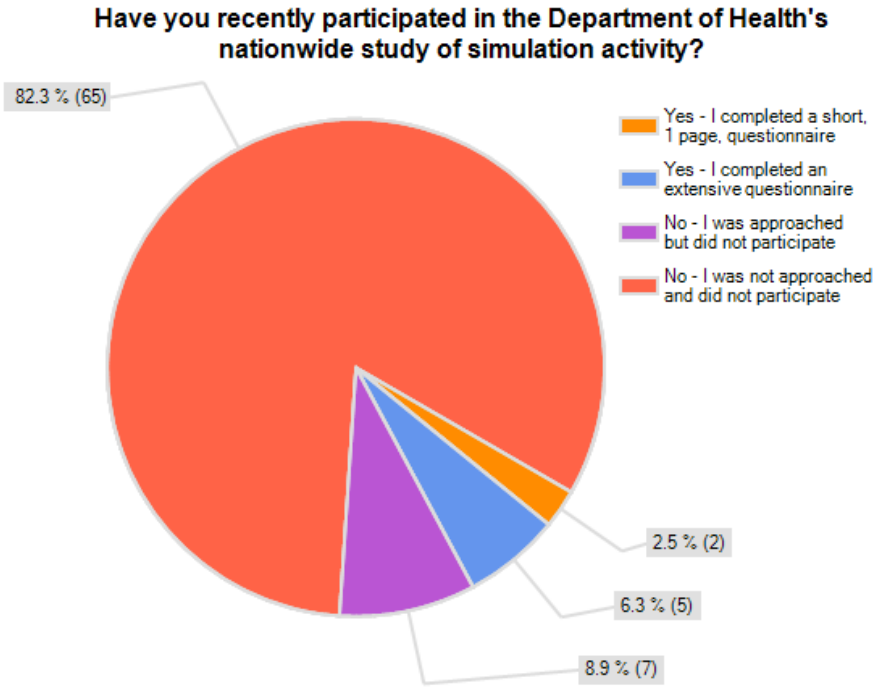
These findings illustrate that respondents to the e-survey were derived from all sub-regions within East Midlands, with the majority of responses coming from Leicestershire and Nottinghamshire. A significant number of responses from EMHWD were not included from these figures, since they span the sub-regions.

We now report on the segmentation of stakeholders who participated in the review e-survey, presenting each question and the response in turn.

DH survey participation **Figure 3.2**

Section 1, Q2: ***Have you recently participated in the Department of Health's nationwide study of simulation activity?***

Although the Department of Health (DH) also recently carried out research into the current provision of simulation-based education across England, the vast majority of stakeholders in the East Midlands were not approached to participate. This is illustrated in Figure 3.2 below.

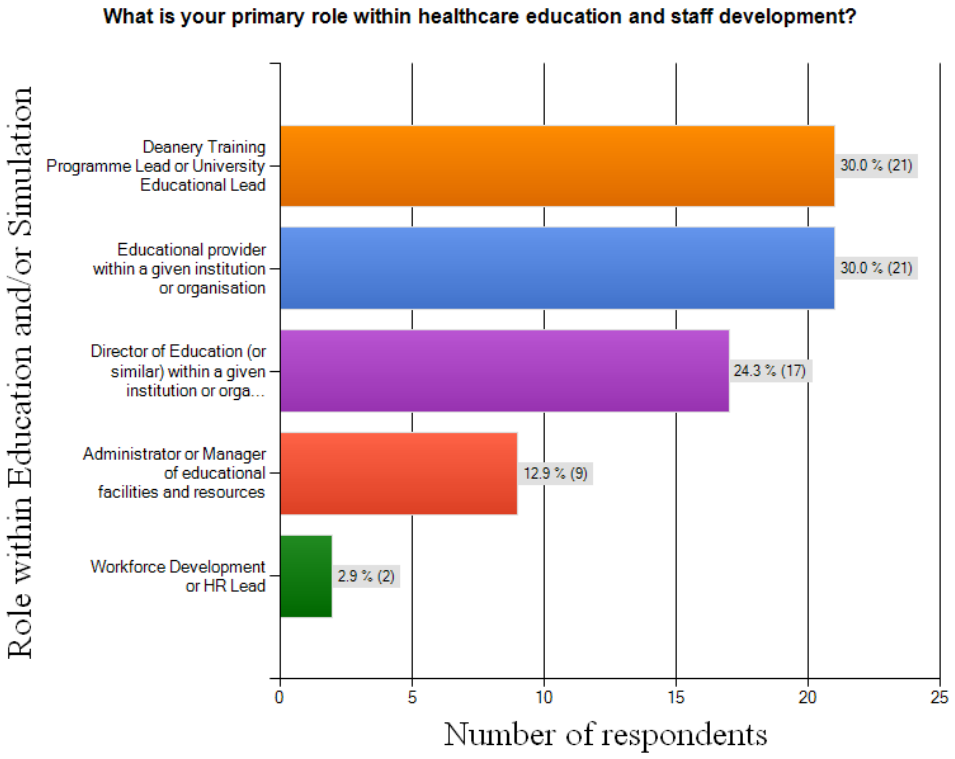


These findings indicate that the vast majority (91%)of simulation stakeholders consulted for this review had not participated in, or even been invited to participate in, the DH research. This indicates that there is minimal duplication between this review and the research undertaken on behalf of DH. Instead of the national research conducted by the DH, this review therefore focuses purely on the East Midlands and the perspectives of stakeholders from healthcare organisations within the East Midlands.

Primary role of respondent **Figure 3.3**

Section 1, Q3: ***What is your primary role within healthcare education and staff development?***

Findings from questionnaire responses indicated that the stakeholders who responded had a range of roles within the simulation and education agendas. The diversity of roles held by stakeholders is illustrated in Figure 3.3 below.



This analysis clearly indicates that responses come from stakeholders with a range of different roles within the simulation addenda. However, there is significantly less representation from the workforce development/HR area, which may indicate that:

- few individuals with workforce development or HR functions have an interest in simulation-based education within the East Midlands, and/or
- individuals in these areas are underrepresented within this sample

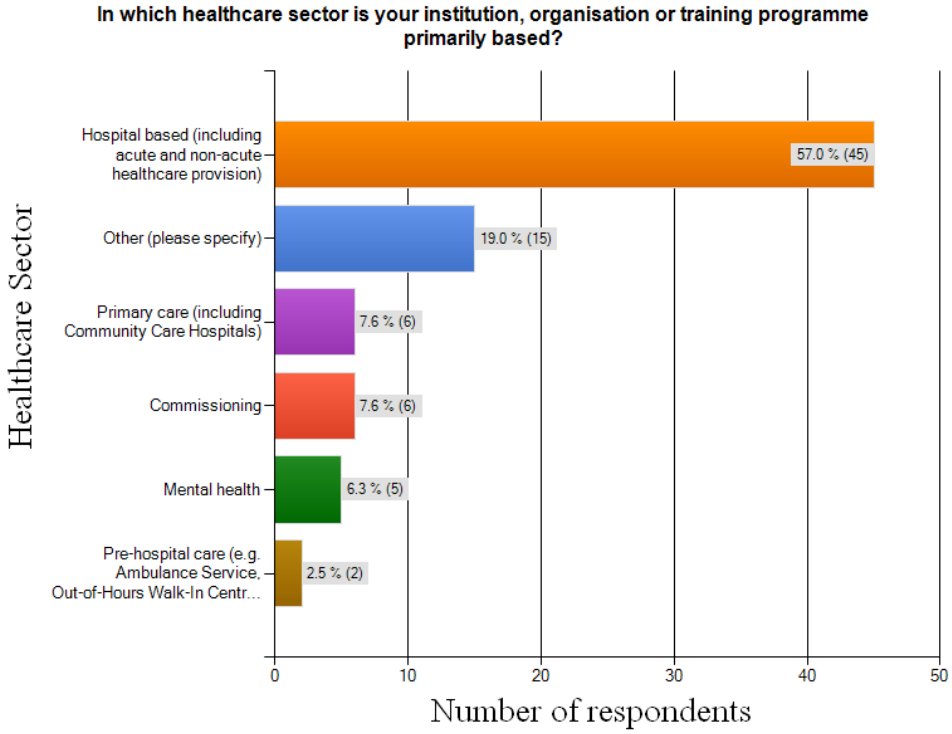
We did send out five reminders and kept the survey open for a longer period, but did not manage to increase representation from this group to any great degree. Further engagement with stakeholders resulting from this review will present the opportunity to engage this specific group to a greater degree. Areas of engagement will include:

- job planning, to take on board the significant need to realise faculty training and simulation delivery in consultant job plans
- medical revalidation, to play in the role of simulation in addressing needs resulting from revalidation findings
- selection and assessment, to maximise the contribution of simulation to these HR processes

Healthcare sector of respondent **Figure 3.4**

Section 1, Q4: ***In which healthcare sector is your institution, organisation or training programme primarily based?***

The majority of stakeholders who responded (57%) were from hospital-based healthcare organisations or training programmes, with other respondents coming from a range of healthcare backgrounds. This is illustrated in Figure 3.4 below.



The significant 'other' segment represented through one or more responses included:

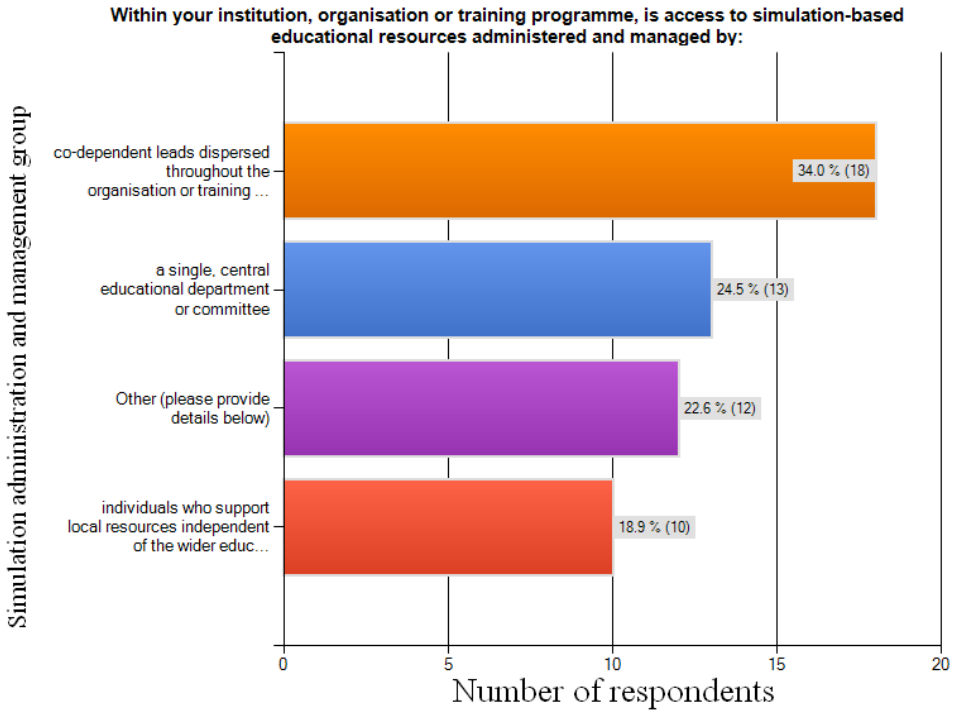
- higher education/university
- dedicated training and education centres
- deanery
- public health

This level of response and the largely representative nature indicates that the findings have a level of validity that gives confidence in 'what this tells us', which we now report on in the next section.

Management and administration of simulation-based education Figure 4.1

Section 2, Q1: ***Within your institution, organisation or training programme, is access to simulation-based educational resources administered and managed by***

Simulation-based education is currently managed and administered in a range of different ways across organisations. Similar numbers of respondents indicated that simulation within their organisation was managed by a central educational department or committee, by leaders dispersed throughout the organisation, or even by individuals independent of the education and training scheme. This is clearly illustrated in Figure 4.1 below.



This suggests that the administration and management of simulation varies greatly within each organisation. Furthermore, analysis of the data showed no clear pattern in the way that different types of organisations administered and managed simulation. Different universities, for example, reported that simulation was managed in each of the different ways illustrated in above. Variation also occurred even within responses from staff belonging to the same organisation. For example, three different respondents from NUH reported three different ways in which simulation was administered and managed, and one responded indicated that all options were applicable, stating:

> *"...some provided by a central source e.g. Deanery, independent leads of local resources or programmes, other heads of School, external companies"*

This indicates that there is not currently a consistent and coordinated way for managing and administering simulation training within East Midlands. This may be due to the range of organisations, schools and departments involved in delivering simulation-based training, sometimes using their own resources, and sometimes using shared resources, or equipment sourced externally. This level of mix provides a strong base for what might emerge as engagement across a network of stakeholders within East Midlands.

Some of the other ways which respondents indicated that simulation was managed and administered included:

- division between members of staff who use simulation equipment
- sourcing of simulation from other departments, organisations, or external providers
- division of management and administration between schools, universities, trusts and the Deanery
- simulators provided for a wide range of institutional need, eg patient simulators for consultant interviews in addition to undergraduate and postgraduate GP training and assessment
- coordination by programme leaders and implementation by module leaders and academic teachers

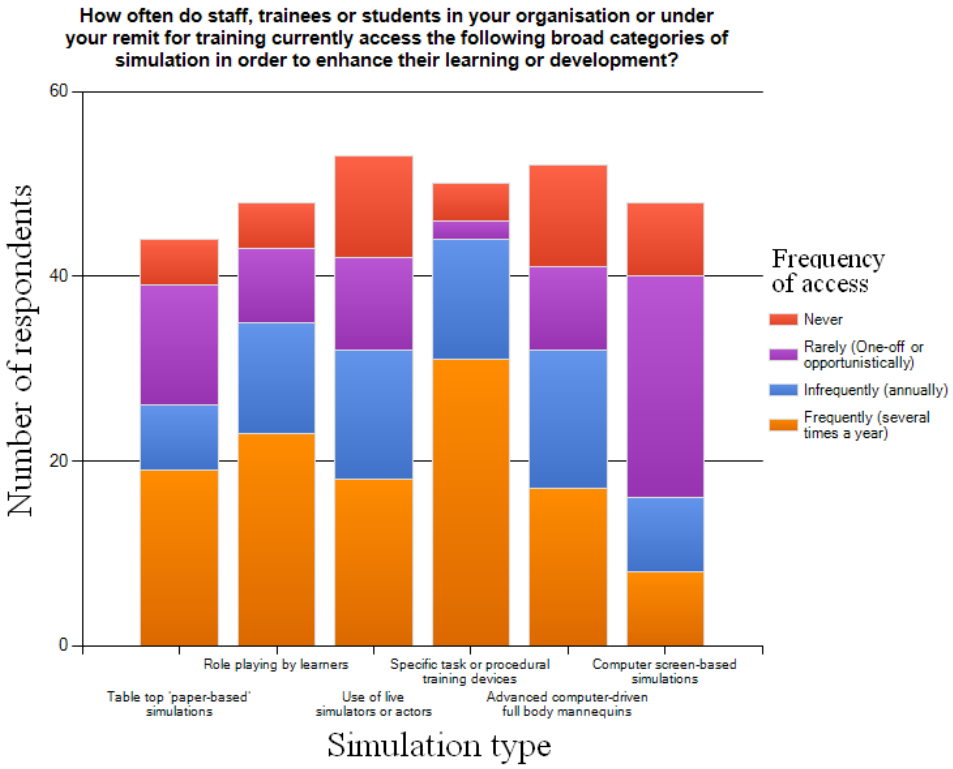
These findings are largely what we would expect to see. There is no 'one way', nor 'best way'. Rather it is apparent that simulation 'emerged' across East Midlands, and that there is an obvious opportunity for stakeholders to work together in response to the external pressures highlighted in the Section 1.

These findings also report on the *means* of administration and management, not its *effectiveness*. They show the multiplicity of ways of cascading information and networking in and across organisations – all of which can be developed further to enhance effectiveness of simulation provision across East Midlands.

Frequency of access to different types of simulation-based training Figure 4.2

Section 2, Q2 - *How often do staff, trainees or students in your organisation or under your remit for training currently access the following broad categories of simulation in order to enhance their learning or development?*

Simulation-based training is most frequently accessed to support trainees to undertake specific tasks or procedures. The majority of respondents (62%) indicated that simulation training for specific tasks or procedures is accessed by trainees several times a year. This is perhaps unsurprising given the range of simulation equipment available to train participants in specific procedures, such as resuscitation. The reported frequency of access to each type of simulation is clearly illustrated in Figure 4.2 below.



These results illustrate that computer screen-based simulation is the least frequently accessed, with half of the respondents indicating that this kind of simulation was only rarely accessed by trainees, and a further 17% indicating that this kind of simulation was never accessed. Tabletop 'paper-based' simulations were also rarely available to 30% of respondent's trainees and in 11% of instances trainees never accessed tabletop simulations.

Perhaps unsurprisingly, high fidelity simulation such as computer screen-based simulations and advanced computer-driven full body mannequins were the types of simulation which some respondents (up to 19%) indicated their trainees cannot access.

A number of organisations – principally those at the low fidelity end of the continuum – indicated that trainees are not able to access the full range of simulation types, which is understandable given the range of simulation means available. It will be important to define the educational objectives, then establish which simulation modes are most appropriate to them.

We intuitively felt that the findings for computer screen-based simulations was lower than we might have expected, so this was a key area explored with stakeholders in subsequent interviews. What we found was:

- there is an absence of quality software currently available to be used on computers
- the infrastructure for provision is historically coming from the application of mannequins and live simulators/actors, rather than computers
- the previous trend has been around the establishment of more centrally located facilities rather than a distributed network
- some respondents viewed computer screen based simulations as expensive
- some respondents believed that computer screen based simulations were not as realistic and would not deliver the same outputs as other forms of simulation
- one area where computer-screen based simulations does appear to be used by respondents is in practising and assessing decision making using simulated scenarios

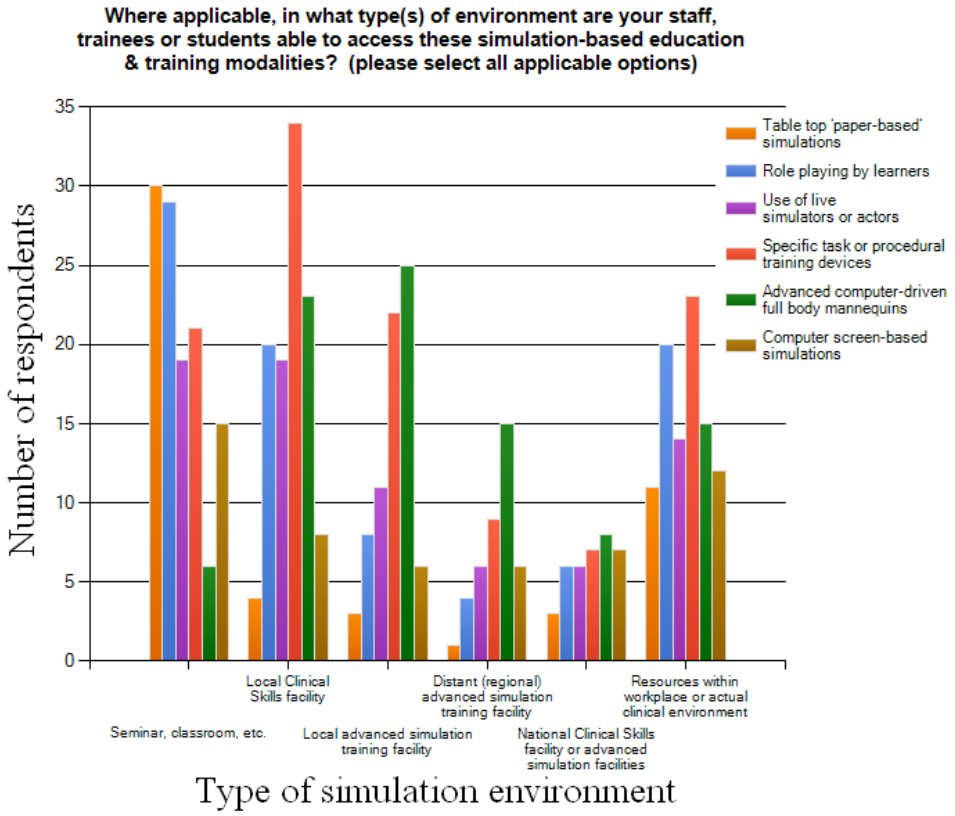
Looking ahead, however, stakeholders saw a significant upside to the future use of computer screen-based simulations:

- facilities are now being established to develop 3D and Wii technologies and their applications, for instance the work of the School of Science and Technology at the University of Northampton
- effective computer provision enables more remote access, and therefore can facilitate the broader training of both faculty and trainees
- there is a recognition of the improving quality of software packages, benefitting from the quality of e-learning increasingly available, allied to developing technologies such as 3D
- trainees receiving simulation are from what is called Generation Y, who are 'digital natives', in contrast with earlier trainees from Generation X who are referred to as 'digital immigrants' – much can be learned from Generation Theory in understanding the needs of trainees

The final point here is that these types of simulation are largely used in an integrated fashion – with the availability and use of computers expected to make a more significant contribution in future.

Section 2, Q3: ***Where applicable, in what type(s) of environment are your staff, trainees or students able to access these simulation-based education & training modalities? (please select all applicable options)***

The majority of simulation-based training takes place locally, within clinical skills facilities or local advanced simulation training facilities. This is clearly indicated in Figure 4.3 below.



These results show that tabletop simulation is predominantly delivered within a seminar or classroom environment, with very few reported instances of sourcing this training type from regional or national facilities. This is reflective of the overall usage of national and regional simulation centres, with only a small minority of respondents reporting that staff accessed simulation-based training at a national or regional level across all simulation types (with the exception of accessing advanced computer-driven full body mannequins at regional facilities).

Respondents indicated that staff from their organisation mostly travelled to distant (regional) advanced simulation training facilities to access advanced computer-driven full body mannequins for training purposes. Interestingly, the majority of respondents who travelled to receive this simulation training were based in the north of the region. This indicates that there may be a gap in this type of provision in the south of the region.

Most respondents representing simulation centres also indicated that they travelled regionally to access advanced computer-driven full body mannequins for training purposes.

The one finding that stood out from the DH national study was to indicate the lack of support for a centrally located national simulation facility in England. This finding is mirrored in our review results where some respondents highlighted the need for more high fidelity facilities, most saw the benefits in a more distributed approach to provision.

Rather, what came out when we explored this issue with stakeholders was their keenness to develop a range of more locally based models of simulation provision, sometimes referred to as 'distributed', 'integrated' and/or 'hub and spokes'. The drivers behind this included:

- recognition that financial resources will not in future support costly, centrally-based facilities
- focus on integrating simulation with patient-focused care on the ward or in theatre or treatment area
- enhanced computer capabilities and technologies to enable this to happen
- emphasis on simulation application for enhancing teamwork, referred to as 'human factor' training

While historically it can be observed that the more specialist the simulation the more centrally it is provided, there is an expectation that this will be less so in future with the development of enhanced hardware and software.

However, there will always be a need for high technology, and therefore high cost, facilities to be provided in limited numbers of locations, so key to any of the models described above will be enabling access to those who would most benefit from simulation training across East Midlands. It may be particularly important that facilities area available to deliverers of simulation training, to enable them to access the training they require to enable high-quality provision. This will need to be reflected in the emerging strategy.

Equipment/resources currently available

Section 2, Q4: ***Please list ALL equipment and resources currently available within your organisation to support simulation-based training***

Asking for ALL equipment and resources, we understandably received considerable response to this question. Though our intent has not been to carry out an audit of facilities for simulation in East Midlands, we were keen to gain insight to what is available. Working with the steering group for the review, the equipment and resources were analysed and clustered under the following headings:

- full body mannequin/full immersion resources
- part task trainer resources
- desktop, computer-based resources
- live simulators/actors
- faculty resources

Detail of what is available across East Midlands in each category is presented in Appendix 2.

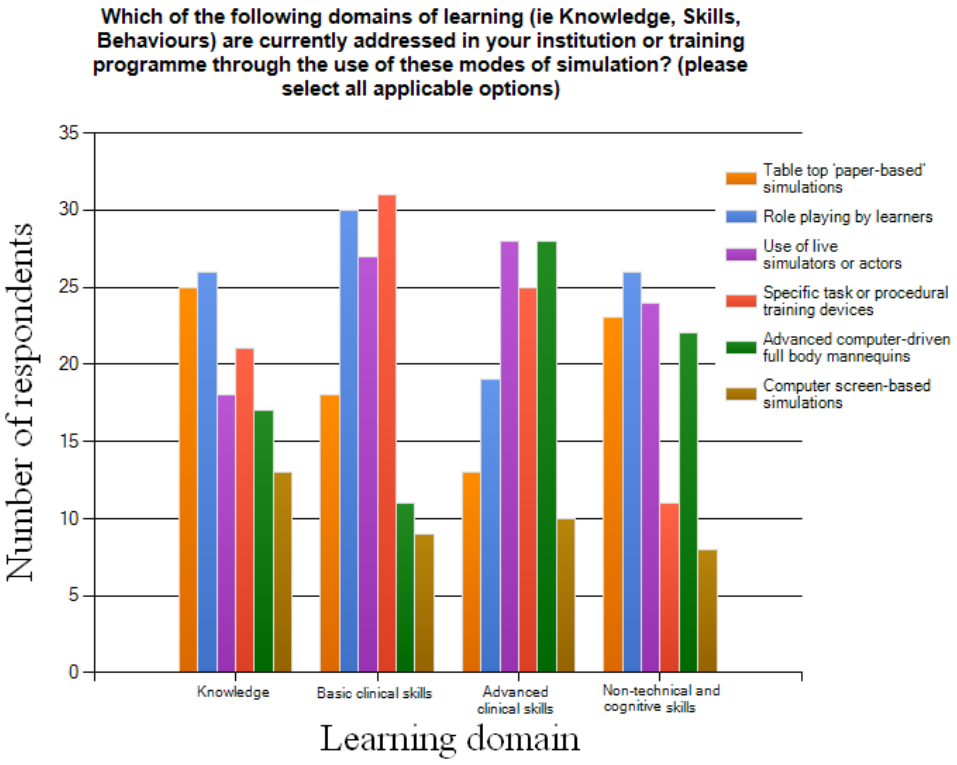
These findings tell us a number of things:

- given the multiplicity of resources, there do not appear to be obvious gaps across the whole of East Midlands; however, these resources will be available in localities, for specified groups, and potentially with constraints to access, such as the level of technical support, trainer availability, etc
- there is a need to analyse these resources further through a more detailed audit in relation to prioritisation for specified groups
- there is a need to work in partnership across the NHS and academia to enable the needs of these key recipients to be met, and the available resources to be maximised, avoiding either duplication or under-utilisation.

Knowledge, cognitive and clinical skills development **Figure 4.4**

Section 2, Q5: ***Which of the following domains of learning (ie Knowledge, Skills, Behaviours) are currently addressed in your institution or training programme through the use of these modes of simulation? (please select all applicable options)***

Respondents were asked to indicate which learning domains their organisation currently developed through the use of simulation-based education. They reported that simulation training addressed development in each of the four learning domains (knowledge, basic clinical skills, advanced clinical skills, and non-technical and cognitive skills). This is illustrated in Figure 4.4 below, which shows the number of respondents who indicated that development occurs in each of the four learning domains.



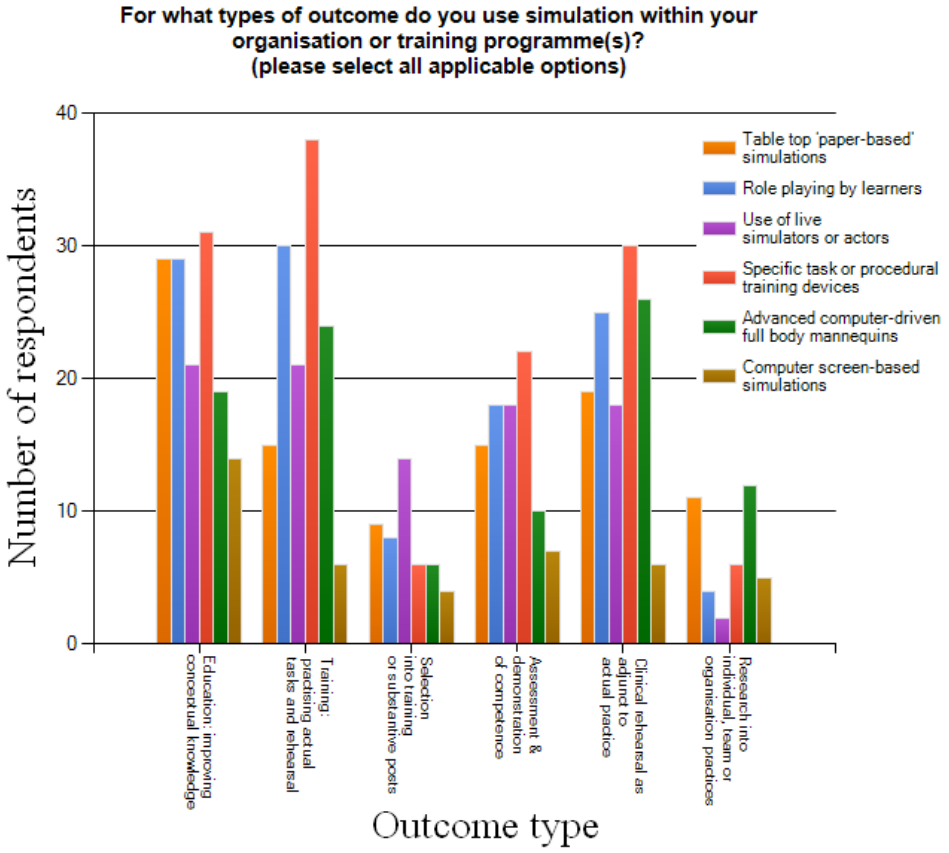
These results show, perhaps unsurprisingly, that the extent to which each type of simulation addressed each of the learning domains mirror the extent to which each mode of simulation was accessed. This suggests that there is a direct relationship between the accessing of simulation-based training and realising benefits in associated learning modes.

The major contrast appears between specific task or procedural training devices and advanced computer-driven full body mannequins – the application is the reverse between the learning domains of basic clinical skills and non-technical cognitive skills respectively. Basic clinical skills tend to be developed more through tasks/procedures and somewhat less through high fidelity full body mannequins, while there is a tendency for the reverse to be observable for developing non-technical cognitive skills.

Purpose of using simulation-based training **Figure 4.5**

Section 2, Q6: ***For what types of outcome do you use simulation within your organisation or training programme(s)? (please select all applicable options)***

Participants were asked to indicate what outcomes they used simulation-based education to achieve. The reasons which participants used simulation training are indicated in Figure 4.5 below.



These findings show that simulation training is most often used to practice actual tasks and procedures, with the exception of computer screen-based, or paper-based learning, which are most frequently used to improve conceptual knowledge. Advanced computer-based mannequins were also used mostly for clinical rehearsals and skills drills.

Few respondents indicated that they used simulation for either selection into training or substantive posts, or research into individual, team or organisational practices. Where respondents did indicate that they used simulation for selection into training or substantive posts, they mostly used live simulators or actors. Where respondents indicated they used simulation into individual, team, or organisation practice, they mainly used advanced computer-driven full body mannequins or table-top paper-based simulations.

The broad purpose of simulation application is currently therefore to enable education and training, along with clinical rehearsal – much less so currently for the purposes of selection, assessment, induction and research.

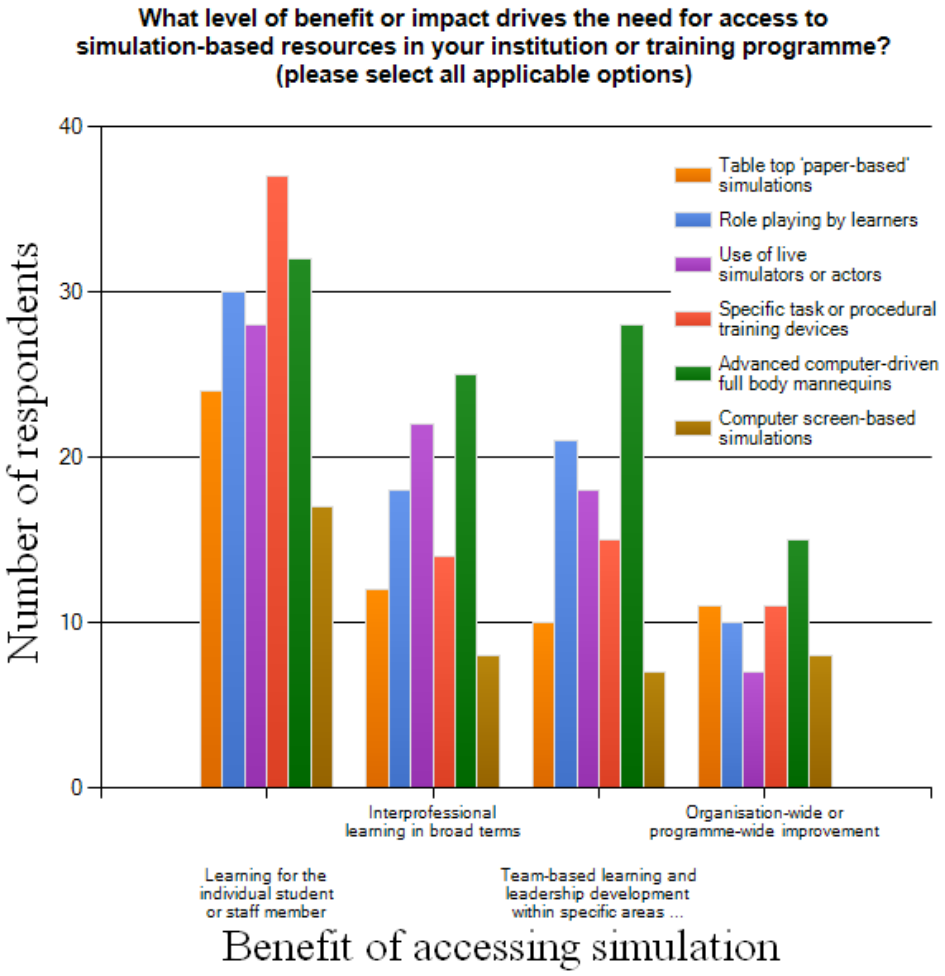
We explored these findings with interviewees, particularly to ask them to look forward to future use of simulation. The overwhelming response was that in future the use will expand for selection, assessment and rehearsal. The drivers behind this were highlighted as:

- pending implementation of medical revalidation will increase use for assessment, principally for remedial training
- on-going emphasis on continuous professional development (CPD) will equally increase the use of simulation for assessment
- greater availability of higher quality applications will give greater validity to selection and assessment applications
- simulation is increasingly benefitting both the 'hard' development of technical skills and the 'soft' development of human factor training in areas of communication and team working

The development of more team-based training, aided and abetted by simulation, will also underpin locally-based team rehearsal of clinical practice and procedures.

Section 2, Q7: ***What level of benefit or impact drives the need for access to simulation-based resources in your institution or training programme? (please select all applicable options)***

Learning for the trainee – whether student or faculty – was by far the most commonly reported impact of simulation training, reported across all types. Learning for individuals was particularly highly reported for training using specific tasks or procedural training devices. This can be clearly seen in Figure 4.6 below which shows the benefits that respondents hope to achieve from undertaking different types of simulation.



These findings also illustrate that the impact of using advanced computer-driven full body mannequins was greater than almost all other kinds of simulation, across all types of impact reported. This suggests that this high fidelity training provides high impacts where delivered.

In comparison to other types of simulation, substantially less impact was derived from computer-screen or table-top based simulations, suggesting that these modes of simulation are perceived to deliver less value than other kinds of simulation training, whether due to availability or maturity of this mode of simulation training. This is supported by findings from a number of follow-on interviews, where respondents indicated that computer-based simulation was not believed to deliver the same impacts, or to be as realistic, as other modes of simulation.

Use of live simulators or actors frequently delivered benefits in individual learning, inter-professional learning, team-based learning and leadership development, but very few respondents indicated use of actors delivered organisation-wide improvements.

Overall, few respondents noted organisation-wide improvements coming from any kind of simulation, with the exception of advanced computer-driven full body mannequins.

These findings were developed through follow-up interviews. Of particular interest were the opportunities in the future for team-based and organisation-wide simulation application. There was support for development in both these areas for a variety of reasons:

- failures in patient safety – specifically mentioned was the findings from the Francis Inquiry into Mid Staffordshire – were highlighted as being able to be tackled through more effective teamwork using simulation techniques
- professional boundaries are increasingly being blurred, making human factor training around communication and teamwork increasingly important
- technology is increasingly enabling simulation training to be locally and team-based, through interaction around devices that enable user interaction and response
- much of team-based training is as much 'low tech' as it is 'high tech', so it can be cost effectively applied in local settings

The high benefit perceived from advanced computer-based full body mannequins will pose priority benefits – to invest in these facilities than can be locally used, through the facilitation of the right number of staff with the right skills, as much about effective feedback as in use of equipment.

We are cognisant that these findings are also based on the views of providers rather than users. Hence, we facilitated a focus group of trainee anaesthetists to get their views on the benefit derived from simulation. What they told us echoed the survey findings:

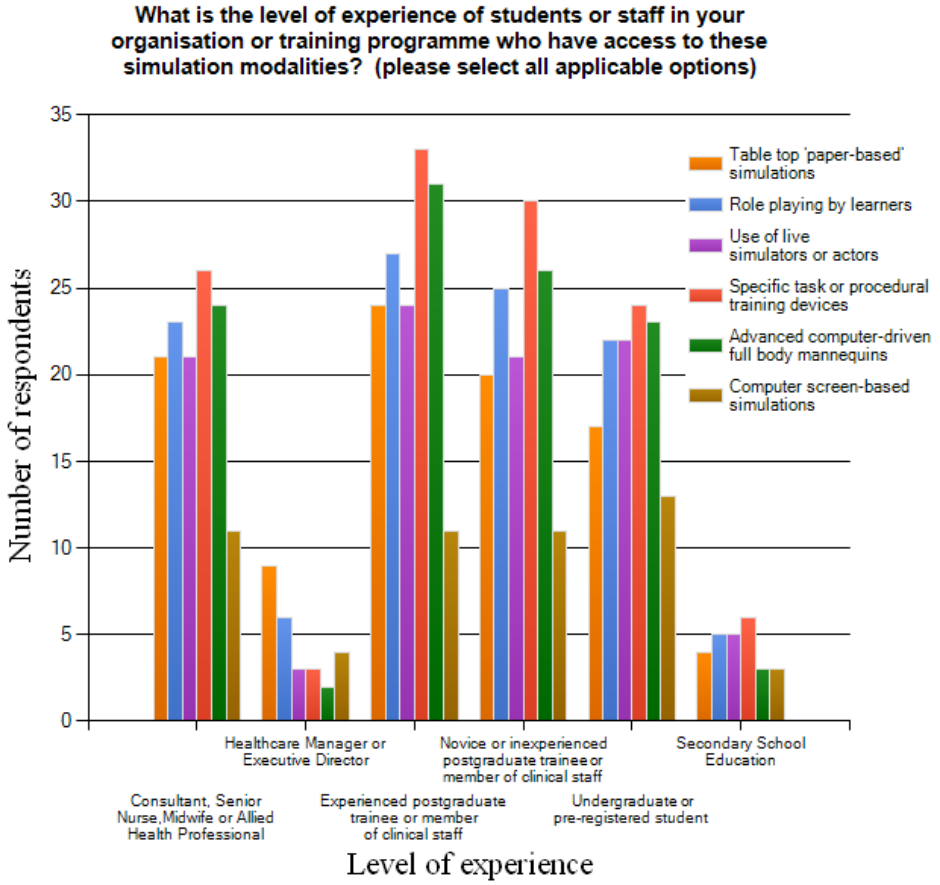
- they see benefit of simulation in both clinical and laboratory settings, the latter being the place to "make a balls-up in a safe environment"
- there is both direct student benefit, and benefit for the wider team, through simulation provision
- if anything, more simulation training should be available

While response to this might be, "well, they would say that", there was clear recognition of the benefit to them personally and as a professional group as a means to enhance patient safety.

Accessibility to different levels of trainees **Figure 4.7**

Section 2 Q8: ***What is the level of experience of students or staff in your organisation or training programme who have access to these simulation modalities? (please select all applicable options)***

Very few respondents reported that any of the different modes of simulation-based education were available to healthcare managers (with the exception of table top 'paper-based' simulations) or secondary school only educated trainees. This might suggest that the simulation-based education is more commonly provided to frontline providers of healthcare. Indeed, clinical staff, new and experienced, were those reported to have greatest access to simulation-based education. Moderately high numbers of qualified staff such as consultants, senior nurses, allied health professionals (AHPs), as well as undergraduate or pre-registered students, were reported to have access to simulation-based education. The extent to which each type of simulation was available to each level of staff is indicated in Figure 4.7 below



These findings also show advanced computer-driven full body mannequins and specific task or procedural training devices were the most commonly accessed simulation types, for frontline staff. In contrast, role playing and table top-based learning was more commonly used to train healthcare management.

We explored through subsequent interviews what we viewed as the significantly high level of response for the use of live simulators or actors. What we found was:

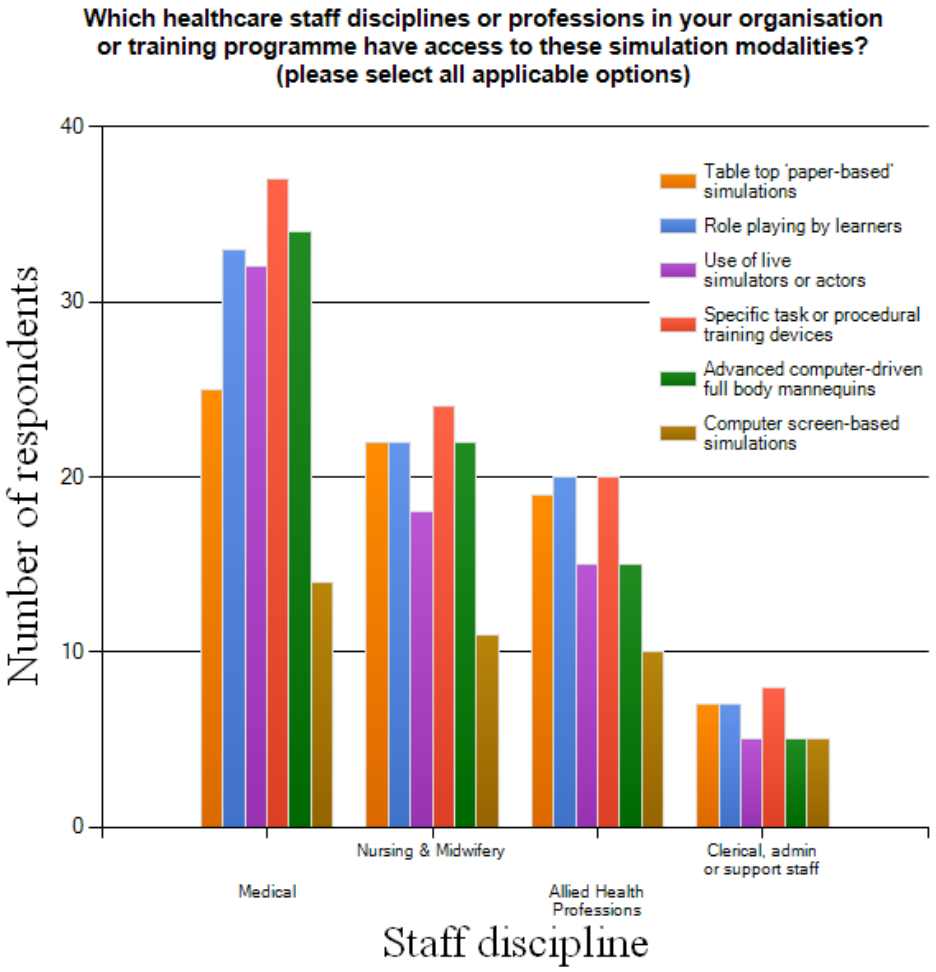
- this type of provision makes simulation training 'real'
- there are many varieties of live simulation, from the expert patient panel to 'family and friends', but the latter is at the end of the continuum that is now being moved away from
- the training of actors is as important as their availability, since they must react effectively to evolving situations
- these applications of training are increasing being seen as beneficial to address issues around human factor relationships, such as teamwork and communications, further focused by the recent Francis Inquiry

These findings also focus on the prioritisation for this scarce resource. We were told anecdotally of the need to focus on newly qualified healthcare practitioners. The survey findings largely support this emphasis on training, though there is also emphasis on reinforcing the skills of experienced clinical staff, which could be interpreted as providing training for faculty at this level. An example here was the perceived benefit of simulation training to review skills of staff on a regular basis, for instance the work of anaesthetists to ensure the on-going application of good practice as a means to reduce medical negligence claims.

Accessibility to different professions **Figure 4.8**

Section 2, Q9: ***Which healthcare staff disciplines or professions in your organisation or training programme have access to these simulation modalities? (please select all applicable options)***

Respondents indicated that simulation-based training was considerably more accessible to medical staff than to any other professions. They indicated that the accessibility of simulation activities was similar for nursing and midwifery staff and AHPs, while simulation training was far less accessible to clerical and support staff. The accessibility of a range of different types of simulation to the different staff disciplines is outlined in Figure 4.8 below.



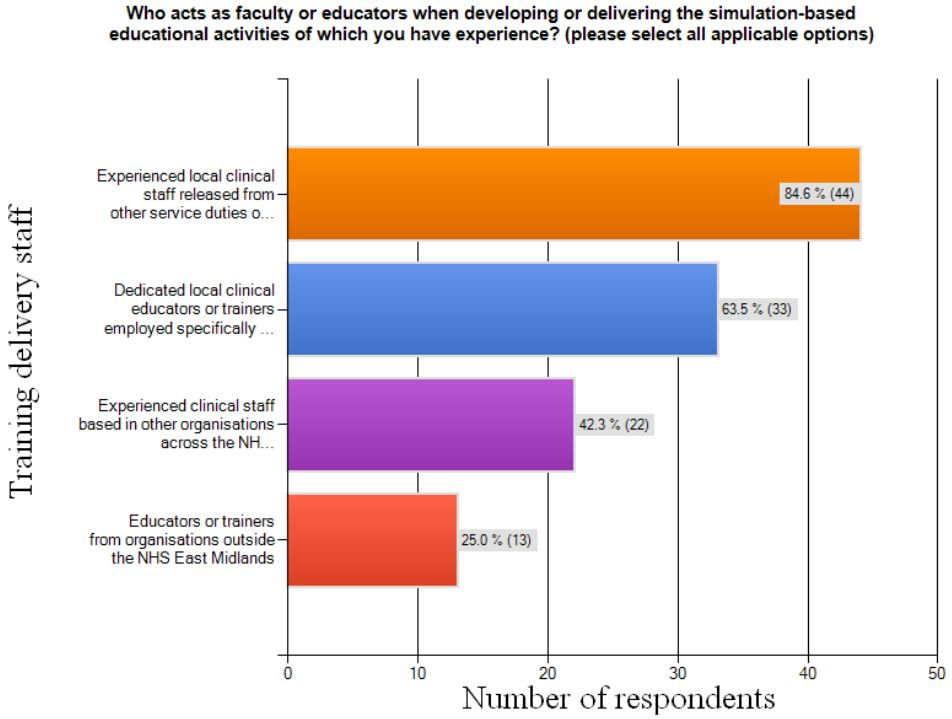
These results also indicate that simulation training for specific tasks or using procedural training services was the most commonly accessed type of simulation training across all staff disciplines. In contrast, computer-screen based simulation was the least accessed type of simulation across al staff groups, reinforcing the earlier finding of its low take-up, or infrequent availability, generally in contrast to other types.

Staff responsible for developing and delivering simulation-based education

Figure 4.9

Section 2 Q10: ***Who acts as faculty or educators when developing or delivering the simulation-based educational activities of which you have experience? (please select all applicable options)***

The vast majority of staff (85%) developing and delivering simulation training are experienced local clinical staff released from other service duties on an occasional basis. The second largest staff group responsible for delivering and developing simulation training are also local staff, but local staff who are dedicated to education or training (64%). The prevalence of local staff in the design and delivery of simulation training is indicated in Figure 4.9 below.



These findings also indicate that a minority of those delivering and developing programmes are sourced from other organisations, with one quarter of respondents indicating that providers are from non-NHS organisations or organisations outside the East Midlands. This suggests that there is a limited amount of outsourcing of simulation training and the majority of delivery staff are sourced locally.

The issue here is the balance between the day job, as recognised through job plans, and the value add time to participate in simulation facilitation and training for this role. As the survey findings show, and as interviewees evidenced, the largest group of trainers are local clinical staff who are challenged to make time from limited availability. Simulation activities are often squeezed out of what is available at the margin.

What is required is clarity of expectation, at both regional and local levels, to align clinical and organisational priorities. Into this discussion should play workforce development and HR staff, who, as highlighted earlier, participated less in this survey than other groups.

The outcome implied from this survey is that job plans recognise the time taken for both facilitating simulation and training in its provision. This is not a 'they would say that anyway' observation, but the need for an insightful dialogue between those who pay for time and those who provide it about the beneficial application of medical staff time towards simulation. This is no less important for other clinical groups, since we were told of nursing regulatory bodies equally being less than supportive of simulation time counting towards clinical practice CPD.

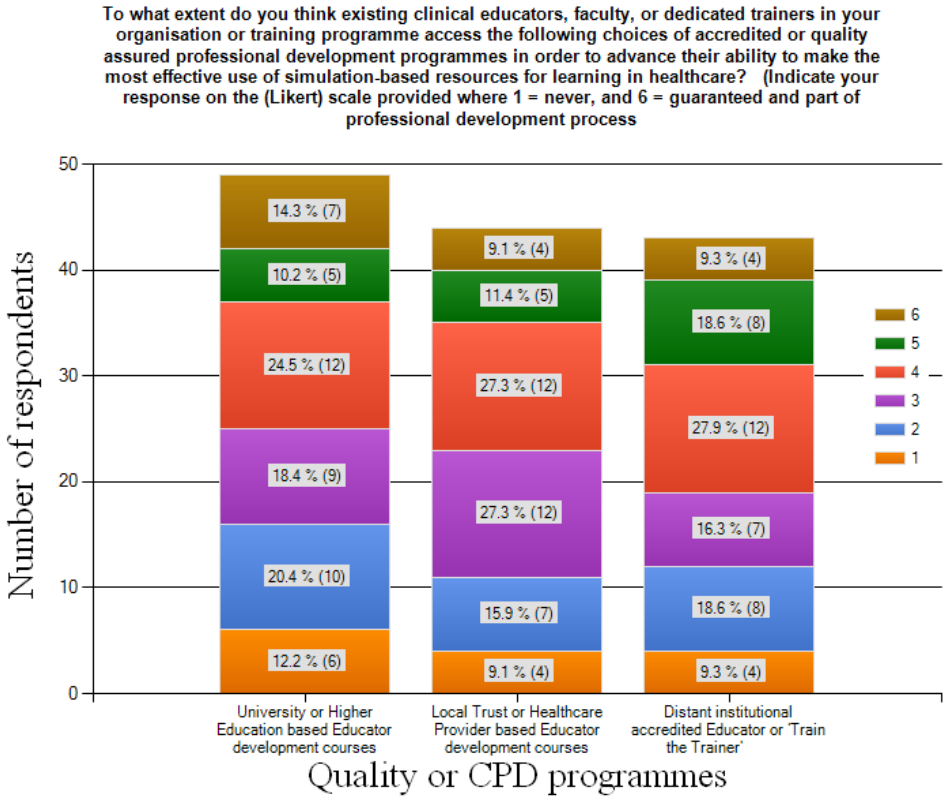
The relevant debate will also be about the impact of simulation. Both trainees and patient representatives highlighted the benefits to us, one with the observation that it "just makes so much sense; it's so blindingly obvious, a sort of no brainer".

Still, evidence of benefit is needed, and we comment on that evidence later in Section 7.

Access to training, support, accreditation and quality assurance for individuals delivering simulation-based training **Figure 4.10**

Section 2, Q11: ***To what extent do you think existing clinical educators, faculty, or dedicated trainers in your organisation or training programme access the following choices of accredited or quality assured professional development programmes in order to advance their ability to make the most effective use of simulation-based resources for learning in healthcare? (Indicate your response on the (Likert) scale provided where 1 = never, and 6 = guaranteed and part of professional development process.***

Responses to the survey indicated high variation in the extent to which staff delivering simulation-based education or training are accessing simulation training or accreditation. The diversity of access to different types of training and accreditation is presented in Figure 4.10 below



These findings illustrate the wide fluctuation in the extent to which staff from different organisations are accessing different kinds of support and training for simulation. Interestingly, these findings also indicate little difference in the extent to which staff use higher education courses, healthcare provider-based training courses or distant 'train the trainer' courses to develop staff's capabilities in delivering simulation-based education.

These findings suggest that there is little consistency in the way in which staff are trained to provide simulation-based education, with variations within and between organisations. These findings are supported by findings from stakeholder interviews, many of whom suggested that a coordinated approach is required to training the trainers in how to use simulation-based education to its fullest advantage.

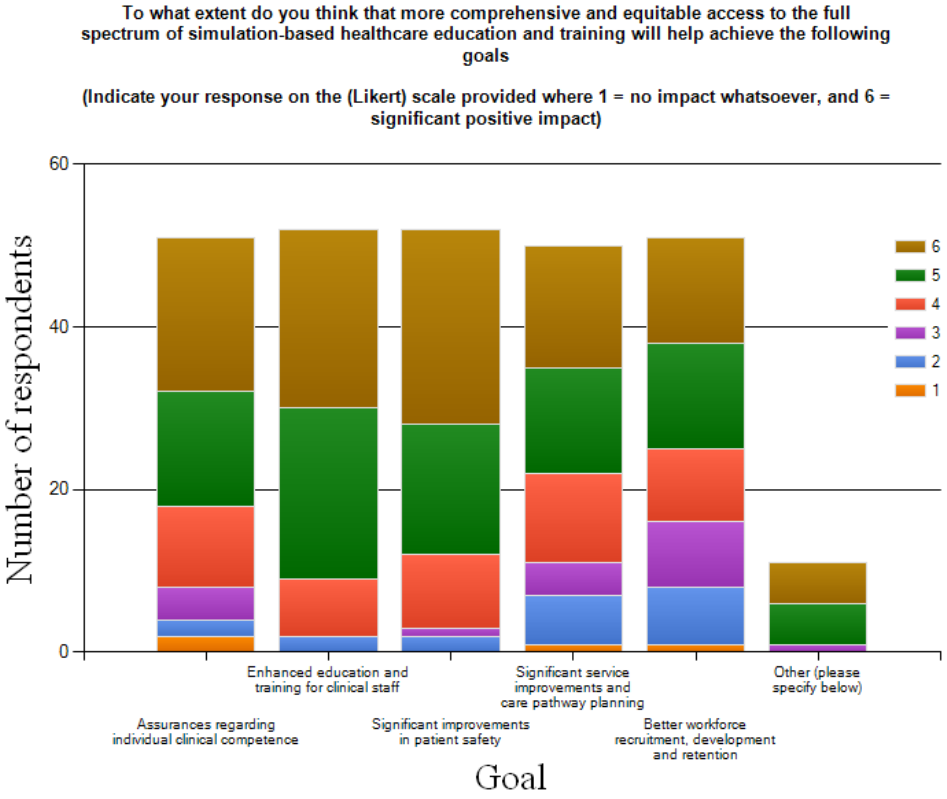
Impact of access to simulation **Figure 4.11**

Section 2, Q12: ***to what extent do you think that more comprehensive and equitable access to the full spectrum of simulation-based healthcare education and training will help achieve the following goals (indicate your response on the (Likert) scale provided where 1 = no impact whatsoever, and 6 = significant positive impact)***

The majority of respondents indicated that equitable access to simulation would have a high impact in the following areas:

- assurances regarding individual clinical competence of all qualified healthcare staff
- enhanced education and training for clinical staff by optimising learning from clinical experience
- significant improvements in patient safety
- significant service improvements and care pathway planning
- better workforce recruitment, development and retention

Respondents were asked to rate the extent to which access to simulation-based education would impact in these regions. The high level of impact reported by the majority of respondents is clearly illustrated in Figure 4.11 below.



These results show that most respondents anticipated that access to simulation would have a particularly high impact on enhancing education for clinical staff and delivering significant improvements in patient safety – this was borne out in subsequent interviews.

This relationship of education and patient safety may reflect a 'cause and effect' pattern, where improved education in turn leads to significant improvements in patient safety, a point made strongly by anaesthetist trainees. This was also suggested in a number of interviews with stakeholders who felt that the impact on an individual directly related to the impact on the organisation – with improvements to their skills leading to benefits at the organisational level.

5 Priorities for Developing Simulation-Based Education in the East Midlands

We received considerable feedback on our open-ended question about prioritisation for future development. Respondents were invited to put forward three priorities in hierarchical order, which we then clustered in key areas.

Section 2, Q13: ***Given the breadth of available simulation-based approaches to support learning and development that are currently feasible, and considering any gaps that you can identify or perceive in the local or regional provision of such educational resources, what would be your 3 top priorities to be considered by any East Midlands wide strategy for developing and supporting simulation-based healthcare education?***

Thirty-eight respondents provided details of what they felt the priorities for developing simulation in the East Midlands should be. The priorities suggested were extremely varied, and, again working with the review steering group, we clustered the findings under the following headings:

- networking
- facilities
- time
- money
- faculty
- strategy
- location
- content

Respondents were also asked to rate their priorities; we present below the analysis of the No 1 priorities, with the detail for Nos 2 and 3 presented in Appendix 3.

Networking

- develop inter-professional learning and sharing best practice
- sharing of best practise in relation to healthcare education nationally/globally
- create a network of expertise in simulation
- improved database of currently available resources
- developing a model for different levels of simulation training across the region so that our learners are all being taught in a similar fashion with similar aims and objectives. It may be that high level simulation is taught in one centre but that medium fidelity is dealt with elsewhere, but the process of delivery is the same – we think about the length of a simulation, we all use a similar feedback model, all simulations will result in an individual action plan etc

Facilities

- more access to advanced simulations
- we need more access to simulation facilities across the board
- build simulation centres
- dedicated clinical training suites
- specific resource for simulation based education programmes

Time

- time in consultants and trainees schedules for carrying out simulation
- provide dedicated medical time to develop postgraduate simulation teaching

Money

- funding and resources
- funding at source – not requiring chasing all the time
- financial – it will be impossible to release staff from clinical duties unless appropriate cover is found
- better Funding – many resources underutilised
- funding for educators

Faculty

- dedicated faculty development for use of such resources
- faculty recruitment and recognition strategy – releasing time to teach as well as quality of faculty
- education in simulation training
- adequate instructor training as the debrief is the most important part of any program (neonatal instructor training course in development in Leicester!)
- release trainers from clinical duties
- expand SPA time for scenario training
- supporting availability of educators; freeing them from clinical activity to teach

Strategy

- clear strategy for the development of high tech facilities for midwifery and child simulation
- an SHA strategy for simulation
- better organisation of current resources
- goals defined
- systematic approach to the use of simulation in clinical skill development in core training in speciality
- creation and validation of specific learning outcomes for generic simulation based education and training
- mapping of existing specialist resources and indication of level of usage
- research re SP effectiveness and subsequent promotion
- identify champions in each trust who could take it forward

Location

- greater local access
- ease of access

Course content

- annual evaluation of all medical staff in APLS skills
- clinically competent delivering safe care across the board
- generic material on prioritisation, time management etc
- team-working
- pecutaneous vascluar techniques and access
- ensure it is multi-professional
- physical care interventions

Reflecting on what these priorities tell us, and taking into consideration the 2nd and 3rd priorities, a number of **themes** emerge:

- there is an enthusiasm for, and clear recognition of, the need to work more effectively across organisations, professional groups and geographies to develop and utilise the simulation infrastructure in East Midlands
- while there is some movement for new facilities, the greater focus is on maximising what is already in place, namely around access and utilisation
- time is a constraint, and needs to be recognised in job plans so that it is both effectively allocated and accounted for
- while there is still a desire for 'money, money, money', the more reflective ideas are around transparency of allocation, reallocation as appropriate for areas like faculty time and training, and secure funding in turbulent times
- develop and maximise faculty contribution, again taking an East Midlands perspective to spread the available expertise, and develop it further
- the need for an East Midlands strategy was by far the area of greatest focus – to define goals, provide consistency, map and utilise resources, and develop the framework for provision
- while there were some suggestions for the development of specific facilities, eg high fidelity in the south of East Midlands, the greater focus was on enabling local access, linked to an integrated model of provision
- simulation courses were viewed as enabling skill development, team working, multi-professional learning and increasingly self-directed learning

These findings will contribute to the options for prioritisation in the emerging East Midlands simulation strategy.

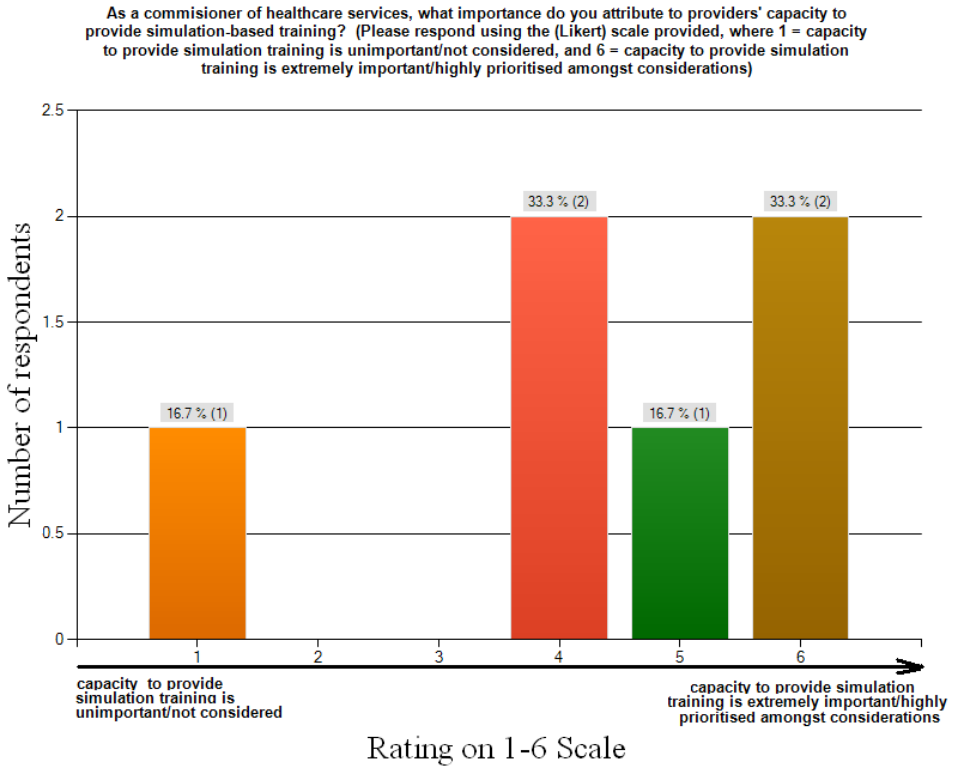
6 Commissioner Views on Simulation Provision

We asked commissioners to complete a different set of questions. Of the 9 PCTs in East Midlands, 4 responded to the survey, which at 44% is a lower response rate than for the questionnaire overall. This may be explained by commissioners being further removed from the 'coalface' of simulation provision, but taking into account the low response, the findings from those few who did respond are insightful, and are presented in this section. Also reflected is insight from the SHA as commissioner of EMHWD as the provider unit.

Importance of simulation to commissioners **Figure 6.1**

Section 3, Q1: ***As a commissioner of healthcare services, what importance do you attribute to providers' capacity to provide simulation-based training? (Please respond using the (Likert) scale provided, where 1 = capacity to provide simulation training is unimportant/not considered, and 6 = capacity to provide simulation training is extremely important/highly prioritised amongst considerations)***

To understand the extent to which simulation provision was considered in the commissioning of staff training and education, we asked commissioners to rate the importance of a providers' capacity to provide simulation in the commissioning process. The responses from commissioners were mostly positive, suggesting that the ability of providers to provide simulation is important in the commissioning process. This is clearly shown in Figure 6.1 below.



This analysis shows that the majority of commissioners who responded rated the ability of a provider to deliver simulation as being moderately to extremely important in the commissioning process. However, there is one notable exception – one response indicates that a provider's capacity to provide simulation training is currently unimportant in the commissioning process.

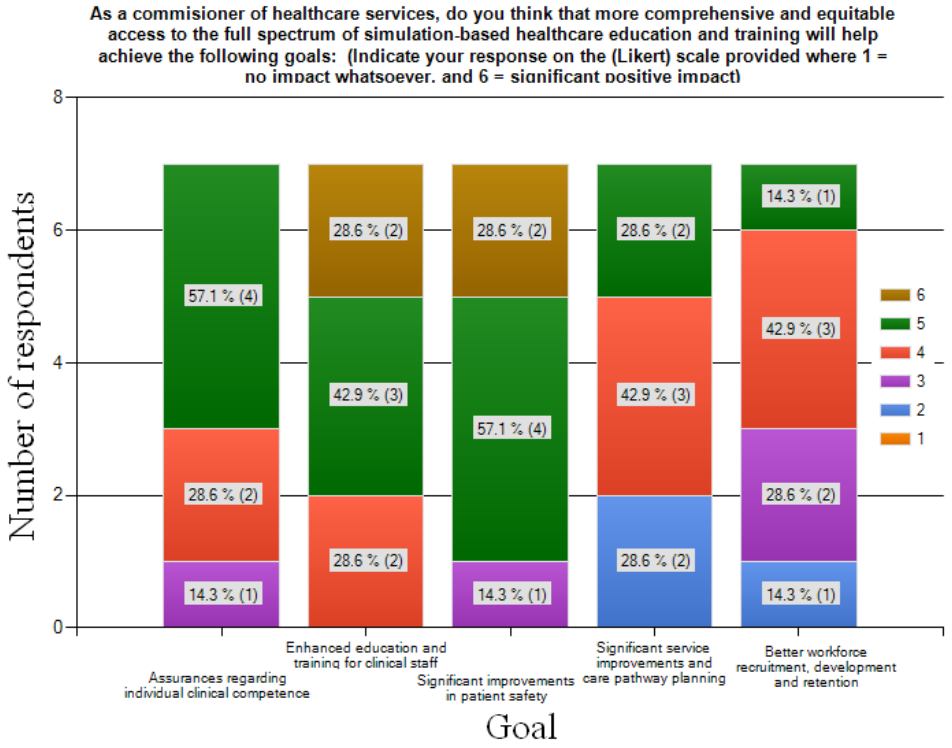
Overall, these responses are positive in suggesting that the majority of commissioners are aware of the importance of simulation, and take this into account in the commissioning process. The isolated negative response may, however, be indicative of variations within the extent to which simulation is given consideration by different PCTs, with no consistent processes for commissioning of simulation across all PCTs in the region.

The development of a coherent simulation strategy for East Midlands, which commissioners have an opportunity to shape, will go a considerable way to address this point. Key will be recognition of the trade-off of simulation versus other types of investment opportunities facing both the commissioner of the EMHWD as a provider unit, and PCTs, in the current and evolving tight economic climate. The linkage of impact to investment, and the benefit to patient safety within QIPP, will be critical to demonstrate over the long run, and to underpin the case for simulation provision.

Commissioners' perceptions of the impacts of simulation **Figure 6.2**

Section 3, Q2: ***As a commissioner of healthcare services, do you think that more comprehensive and equitable access to the full spectrum of simulation-based healthcare education and training will help achieve the following goals: (Indicate your response on the (Likert) scale provided where 1 = no impact whatsoever, and 6 = significant positive impact)***

To understand how commissioners viewed the impact that simulation has, we asked them to rate the extent to which comprehensive and equitable access to simulation would impact upon a range of healthcare issues. Figure 6.2 below illustrates the extent of impact they reported.



These findings show that commissioners felt that the largest impacts of equitable and comprehensive access to simulation would be in enhanced education for clinical staff and significant improvements to patient safety – this reinforces both what we found through the survey from providers and through subsequent interviews. This may also be seen as 'cause and effect', with increased patient safety coming as a direct result of improved education of staff.

Most commissioners also indicated that access to simulation would have a moderate to high impact upon assurance regarding clinical competence. This suggests that most commissioners feel that simulation training has a positive impact on safeguarding patients by allowing trainees to develop clinical competences in a simulated environment before practising these skills with patients.

Figure 6.2 also indicates that respondent commissioners had mixed views regarding the extent to which simulation might impact upon workforce recruitment, development, and retention, with some commissioners rating the impact as being low, while others rated the impact moderate, or high. This reinforces the findings from providers, who also currently rate the use of simulation for assessment and selection as low – though they generally anticipate greater application in future.

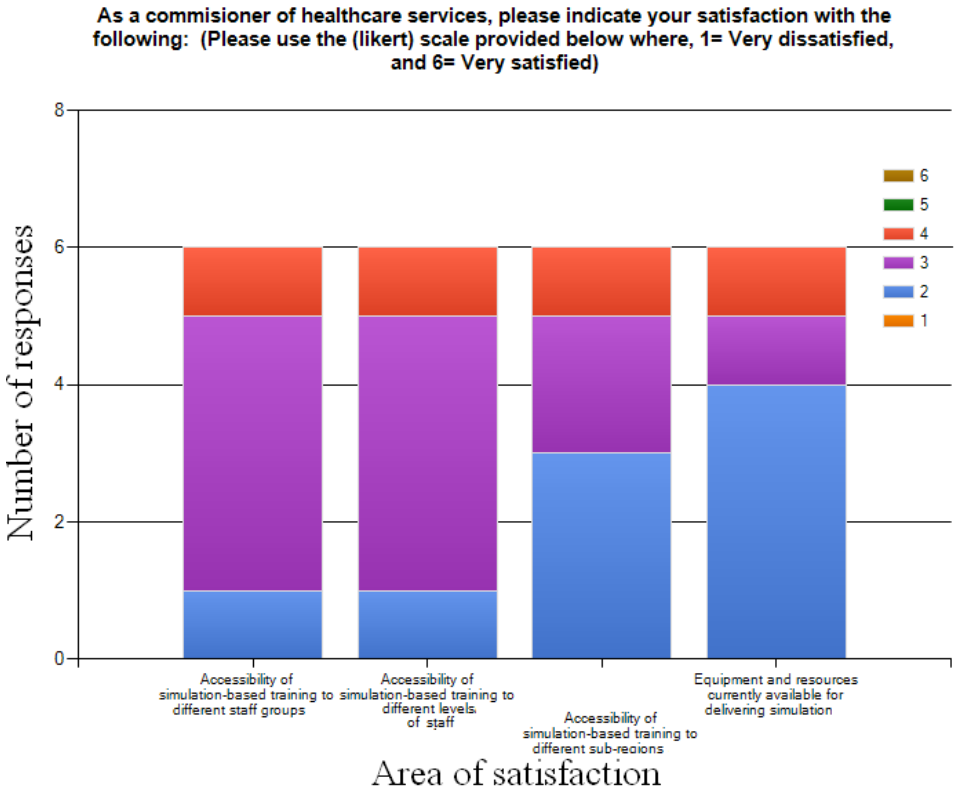
Commissioners' satisfaction with current delivery of simulation **Figure 6.3**

Section 3, Q3: ***As a commissioner of healthcare services, please indicate your satisfaction with the following: (Please use the Likert) scale provided below where, 1= Very dissatisfied, and 6= Very satisfied)***

Commissioners were asked to report their satisfaction with the current delivery of simulation in the East Midlands in a range of different areas, including:

- accessibility of simulation-based training to different staff groups
- accessibility of simulation-based training to different levels/seniority of staff
- accessibility of simulation-based training to different sub-regions
- equipment and resources currently available for delivering simulation-based education to develop staff

Respondents reported their satisfaction in each of these areas, and findings from there responses are clearly presented in Figure 6.3 below.



These findings show high levels of dissatisfaction with the current provision of simulation in the East Midlands from the majority of respondents. It should be noted that these findings are drawn from less than half of the commissioners; however, they are nonetheless insightful and give a steer towards what may be required in future, especially given that commissioners have rated simulation as important to them in the first place.

Of particular interest is the very high level of dissatisfaction with the equipment and resources currently available. This implies that there is most likely considerable scope for discussion with commissioners about plans for investment in equipment and resources to support simulation-based training. However, dissatisfaction does not translate into prioritisation for investment, and it will be essential that a 'wish list' approach is not taken to investment, but rather a specific alignment of simulation priorities with commissioner priorities.

Also of particular interest is the low satisfaction with the accessibility of simulation training to different sub-regions throughout the East Midlands. This was an issue reported by representatives from organisations across the full spread of East Midlands, from north to south.

These responses do not necessarily indicate that commissioners are dissatisfied with the current provision of simulation within the sub-region in which they are based, but it does suggest that they are aware, or believe, that the availability of simulation to some of the sub-regions within East Midlands is not satisfactory.

The strategy development process that will result from this review will give great scope for exploring these issues further, and are in line with the inclination of providers to develop a network of simulation provision across East Midlands.

Perceived gaps in current simulation provision **Figure 6.4**

Section 3, Q4: ***As a commissioner of healthcare services, are you aware of any gaps in, or barriers to, the provision of simulation training in the East Midlands?***

Commissioners of healthcare services were asked if they were aware of any gaps in the current provision of simulation-based training in the east Midlands. Two-thirds of commissioner respondents (4 of 6) indicated that they were aware of gaps in provision. The gaps which commissioners highlighted included:

- silo funding
- patchy commitment at trust level to provision of simulation training
- probable lack of awareness among commissioners about the importance of education commissioning as a component of service commissioning
- lack of clear evidence for the efficacy of simulation training – if it could be shown that it saved money, for example, interest would increase exponentially
- current simulation provision is not easily accessible to Lincolnshire practitioners
- need for both low-medium fidelity and high fidelity facilities; these should include medium fidelity in near-theatre environments to aid training and assessment of trainee anaesthetists and surgeons.
- lack of adequate equipment means simulated training is sometimes not available or accessible

These insights fit well with the perceptions of providers, and their proposals for gap-filling. This gap-filling, if it takes place, must demonstrate greater added value within the QIPP priorities in comparison to recommendations for investment put forward by other clinical services.

Commissioning priorities

Section 3, Q5: ***As a commissioner of healthcare services, what would be your 3 top priorities to be considered by any East Midlands wide strategy for developing and supporting simulation-based healthcare education?***

Six healthcare commissioners provided details of what they felt the priorities for developing simulation in the East Midlands should be, including:

#1 Priorities for Commissioners:

- simulation should be "planned and organised on a multi-professional basis"
- simulation training should be available locally
- there should be more evidence to demonstrate that simulation training produces better outcomes, for example, improved clinical practice
- simulation should be used as a tool to assess competency in addressing performance issues
- appropriate environments are required for the use of current simulation equipment
- more, and higher quality, simulation equipment is required

#2 Priorities for Commissioners:

- it should identify sustainable, recurrent funding to develop simulation
- ease of access
- accessible as possible in a timely manner
- low-medium fidelity near theatre for acute specialties
- development of a centre for simulated training

#3 Priorities for Commissioners:

- it should clearly articulate a model which maximised use of available resources, eg 'hub & spoke', rather than replicating everything in every location
- aimed at all levels of staff
- cost effective
- high fidelity in one or two acute trusts for more complex training

Again, these commissioner priorities are not out of alignment with what providers have in mind. They represent an ideal agenda for discussion about the two sides of the same coin – what commissioners expect and what they want to invest in, and what providers can do with in available resources. As a provider unit, EMHWD is in a challenging role between the commissioners, both PCT and SHA, and the providers of simulation services. It will need to reflect commissioner priorities – clinical and financial – and reflect these in its leverage role with providers, NHS and academic, both of which will need to justify the priority and spend on simulation vis-à-vis the benefit gained.

Importantly, the priorities also focus on providing evidence to underpin impact of simulation provision, which we now address in the next section.

7 Evidence of Impact of Simulation

Commissioners will be seeking robust evidence on which to base their commissioning decisions. We therefore sought to get an updated picture on the available evidence on the impact of simulation – this was prepared by Ruth Longfellow and Bryn Baxendale of the Trent Simulation and Clinical Skills Unit.

The use of simulation for teaching in healthcare has an extensive history, particularly for the acquisition of clinical skills, and dates back to 17th century France when birthing manikins were used (1). Over the last two decades (and especially the last five years) simulation has been applied to healthcare with a more explicit aim of improving patient safety and outcomes (2). This recent interest in simulation has derived largely from parallel applications in other high risk, high reliability organisations such as commercial aviation, nuclear power production and the military. These organisations have vast experience of using simulation for training and development of safe practice, taking individual and team performance as equally important facets, but recognising that evidence of impact takes many years to accumulate across whole organisations or industries.

The GMC recommends the use of simulation to deliver teaching, to facilitate inter-professional learning, and as an experiential learning opportunity (5). The Nursing and Midwifery Council has endorsed the use of simulation explicitly within their undergraduate training curricula to enhance the development of their future workforce. The CMOs report (2009) "Safer Medical Practice: Machines, Manikins and Polo Mints" describes how simulation can be used to teach simple and complex skills within healthcare, which for medical staff translates to trainees and consultants no longer having to learn and practice new procedures on patients (3). This report refers to evidence that simulation skill based training can improve performance by enhancing the learning process in surgical trainees for new skills and techniques, or reducing errors in their application. A trial in Sweden demonstrated that junior surgeons who had been given virtual reality training for keyhole surgery made significantly fewer errors than their peers who had not. The CMO believes that simulation is a vital part of building a safer healthcare system, which is a major challenge for the NHS. The Royal Colleges in the UK are the representative institutions responsible for establishing and maintaining standards for professional specialty training and practice; the CMO has recommended each College to have a named lead for use of simulation in training pertinent to their curricula.

In addition to skills training and improvements in patient safety, simulation has a number of other key drivers in its development. It allows the learner to be at the centre of the educational process, rather than the patient. Opportunities for clinical experience are decreasing due to a reduction in trainees' hours; simulation can bridge this gap and offer an environment where key skills and behaviours can be introduced as part of a formative process, and thus underpin their further development and demonstration in practice (4). The role of simulation in the field of summative assessment is also developing, applicable to selection processes, under-graduate and post-graduate (post-registration) professional examinations and future requirements for revalidation.

While simulation is being recognised and employed increasingly as a valuable educational tool, considerable attention is required to on-going research needs in order to determine its impact and how best to use the breadth of resources that fall under its banner. A number of notable examples do exist within the literature representing emerging evidence that simulation is able to change practice. Weller et al (2002) found that following delivery of a simulation-based course in anaesthesia crisis resource management, participants perceived a change in practice that could be applied to a wide range of events in addition to routine practice (6). McGaghie et al (2006) found that "repetitive practice involving medical simulations is associated with improved learner outcomes", going on to argue that simulation-based practice in medical education "appears to approximate to a dose-response relationship in terms of achieving desired outcomes: more practice yields better results" (7). Dayal et al (2009) found that "students who receive simulation training participate more actively in the clinical environment during the course of the clerkship. Student simulation training is beneficial to learn obstetric skills in a minimal risk environment, demonstrate competency with manoeuvres, and translate this competence into increased clinical participation and confidence" (8).

A few notable examples of publications are beginning to link the value of simulation-based education and training with improved patient outcomes. Draycott and his colleagues (9) have published several papers that link simulation training in the obstetric arena with improved neonatal / new born outcomes. These highlight the difficulties with establishing clear and firm links with any educational intervention and improved patient outcome, but the methodology described is sound and represents a definite positive move in this direction.

In his publication "The Future Vision of Simulation in Healthcare" (2), Gaba discusses the areas for further research and development of simulation in healthcare:

- integrating different types of simulation across different dimensions of application, purposes and target populations
- assessing the impact or benefit of simulation-based training across the various dimensions
- developing applications for units of participation larger than clinical teams (complete work units, entire healthcare organisations)
- establishing bench marks and criteria for competency based performance assessment using simulation
- investigating fundamental aspects of human performance in healthcare using simulation
- use of simulation for usability testing of medical devices and patient care processes, if possible at an early, prototype stage, and before deployment

McGaghie et al (2010), in their recent publication: "A critical review of simulation-based medical education research: 2003-2009" (1), discuss the 12 best practice and evidence-based features of simulation use. Their feeling, having conducted two previous reviews, is that during this six year time span, "the methodological quality and rigour of research published in this period is much improved". They discuss the 12 features, knowledge to date and gaps requiring further research and understanding.

There is no doubt that the evidence supporting the impact of simulation on learning and changing cognition is in its early stages but slowly is accruing. An interesting analogy would be the development of new pharmaceutical interventions, where many years of research are taken to bring a new drug to market, then further time to understand how to make the most effective use of the drug, either alone or in combination. Cook (2010) writes "evidence will accumulate slowly, as drops in a bucket. The reward, although delayed, will be worth it" (10).

References

(1) McGaghie, W., Issenberg, S., Petrusa, E., Scalese, R. (2010) A critical review of simulation-based medical education research: 2003-2009. Medical Education. 44: 50-63.
(2) Gaba, D. (2007) The Future Vision of Simulation in Healthcare. Simulation in Healthcare. 2:126-135.
(3) Department of Health. 150 years of the annual report of the Chief Medical Officer: On the state of public health 2008. Published 2009. www.dh.gov.uk/en/Publicationsandstatistics/Publications/AnnualReports/DH_096206
(4) Kneebone, R., Arora, S., King, D., Bello, F., Sevdalis, N., Kassab, E., Aggarwal, R., Darzi, A., Nestel, D. (2010) Distributed simulation – Accessible immersive training. Medical Teacher. 32:65-70.
(5) General Medical Council (2009) Tomorrow's Doctors: Outcomes and Standards for Undergraduate Medical Education. London, GMC.
(6) Weller, J., Wilson, L., Robinson, B. (2003) Survey of change in practice following simulation-based training in crisis management. Anaesthesia. 58: 471–479.
(7) McGaghie, W., Issenberg, S., Petrusa, E., Scalese, R. (2006) Effect of practice on standardised learning outcomes in simulation-based medical education. Medical Education. 40:792-7.
(8) Dayal, A., Nelli, F., Magrane, D., Goffman, D., Bernstein, P., Katz, N. (2009) Simulation Training Improves Medical Students' Learning Experiences When Performing Real Vaginal Deliveries. Simulation in Healthcare. 4(3): 155-159.
(9) Draycott,T. et al (2006) Does Training in Obstetric Emergencies Improve Neonatal Outcome? Obstetrical & Gynecological Survey: 61 (6): 365-366
(10) Cook, D. (2010) One Drop at a Time: Research to Advance the Science of Simulation. Simulation in Healthcare. 5(1): 1-4.

8 Conclusions and Recommendations

Building on the findings of our extensive stakeholder survey and range of interviews, we now present in this section both a summary of simulation provision in East Midlands, and then our conclusions and recommendations.

8.1 Analysis of provision

Findings from the review illustrated that simulation is provided throughout East Midlands, yet the extent to which facilities and equipment are accessible to staff from different sub-regions is variable. Although findings indicated that dedicated simulation centres are available in the sub-regions, the extent to which these simulation centres are accessed, and the range of simulation activities delivered in each area, are varied. Figure 8.1below illustrates the location of the key NHS hospital-based simulation centres within the East Midlands.

Map of NHS Hospital-based Simulation Centres Figure 8.1

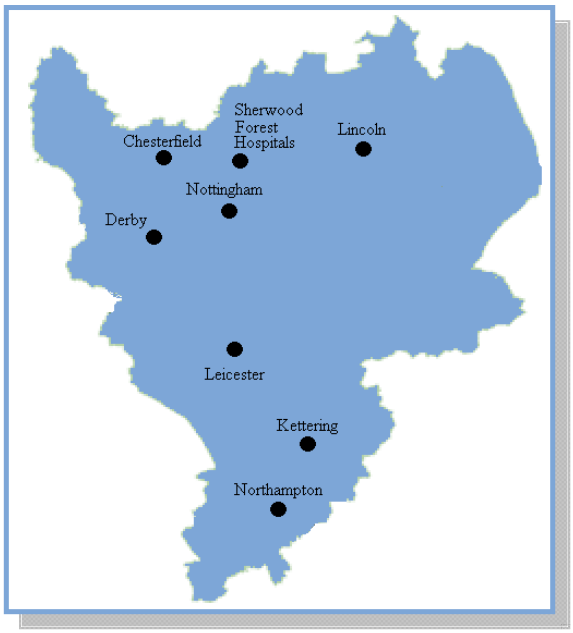


Figure 8.1 indicates the geographic coverage of the simulation centres throughout East Midlands, but does not illustrate the range of simulation services each provides, nor the 'sphere of influence' each centre has.

This is more easily seen in Table 8.1 overleaf. It should be noted that this figure does not list *all* simulation facilities – since this is not an audit but a strategic overview – but presents NHS hospital-based simulation centres of strategic importance within each area. Table 8.1 also indicates only the *maximum* extent of simulation offered by each centre. It should also be noted that the ownership and management of simulation equipment is extremely complex (as highlighted earlier in Section 4), and Table 8.1 does not map the availability of all simulation activities, but instead gives an indication of the strategic significance of each centre.

Sphere of influence and fidelity for NHS Hospital-based Simulation Centres **Table 8.1**

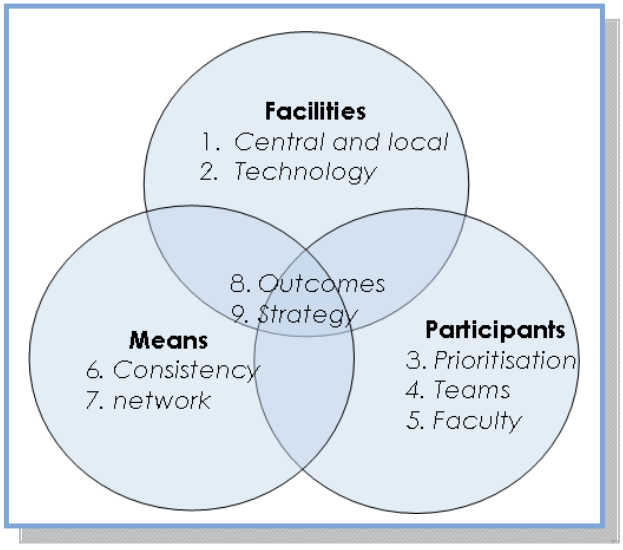
Facility	Fidelity			Sphere of Influence		
	Low	Medium	High	Local	Sub-regional	Regional
Trent Simulation and Clinical Skills Centre	✓	✓	✓	✓	✓	
Leicester	✓	✓		✓		
City Hospital – Nottingham	✓	✓	✓	✓		
Northampton	✓	✓		✓		
Chesterfield	✓	✓		✓		
Lincoln	✓			✓		
Kettering	✓			✓		
Derby	✓	✓	✓	✓		
Sherwood Forest	✓			✓		

Table 8.1 shows that there is a wide range of facilities located throughout each sub-region which delivers low fidelity simulation at the local level. By contrast, medium fidelity simulation is less frequently available at the local/sub-regional level, and high fidelity simulation is even less accessible locally. While the review findings have indicated that there is some support for additional medium and high fidelity facilities at more local levels, the wider view is that facilities can be more effectively accessed and used through networking rather than new build. Nonetheless some respondents also highlighted the need for increased local resources and/or increased sharing of simulation resources between organisations and departments. Furthermore, several stakeholders also indicated a demand for mobile simulation units which would facilitate this sharing on a regional level.

8.2 What the review tells us

What the review findings tell us is illustrated in Figure 8.2 below, with the eight conclusions clustered in three broad areas under the headings of **Facilities**, **Participants** and **Means**.

What the review tells us **Figure 8.2**



Conclusion 1 – Balance of central and local provision

The way ahead for provision of simulation-based education in East Midlands is not a choice between central and local provision, but rather a balance between the two. As illustrated above in figure 8.2, there is a range across East Midlands of facilities spanning the high to low levels of fidelity, and providing regional down to local access. Rather than providing more centrally based high fidelity facilities – mirroring the recent findings in the Department of Health review – the way ahead is to develop further a distributed model of simulation provision around greater integration of current facilities, and development of a wider range of local facilities that get down to the level of patient interaction.

This is supported by feedback from commissioners who highlighted the need for increased equipment and resources, with accessibility being key, rather than specific demands for regional centres. A key issue for discussion between providers and commissioners will therefore be what commissioners expect from providers and the extent to which they are willing to invest to support this.

The critical word here is *integration* of these facilities around a network across East Midlands – this theme will be developed further in a later conclusion. The prospect of a mobile facility was mentioned in some quarters, and there is certainly an example of this now operating in Scotland, though in a much wider and more rural geographic area.

Recommendation – Develop a distributed model of simulation provision across East Midlands to maximise the benefit of the current centrally-located facilities and the still developing locally-focused facilities.

Conclusion 2 – Technology as an enabler

More than once we were asked in discussions if we had seen the film *Avatar*. While it won a limited number of Oscars, the technology and its possibilities for simulation application has fired the imagination. Technology is seen as enabling the development of locally-based simulation facilities, enabling the development of computer applications to facilitate remote access, and to enhance audience participation and response during the simulation process.

Many examples were highlighted of utilising 3D technology and Wii applications to develop a simulation experience that caters to the learning styles of Generation Y. While some of these will no doubt be feasible, others may offer 'commercialisable' innovation that will require patent protection and proactive development. These innovations would therefore need to be prioritised and tailored to the requirements of East Midlands, not just focusing on high tech opportunities, but also the low tech ones that require less resourcing.

Recommendation – The Deanery should consider how to access resources that may be required for pump priming of the more feasible business cases put forward by developers and users.

Conclusion 3 – Prioritisation of access

Simulation provision is limited and will remain so. Resources are equally limited, and will become even tighter. Prioritisation of access to simulation facilities will, therefore, need to take place. Patient safety will be the driver in this respect, with some groups requiring greater emphasis. The groups highlighted during the review as posing the greatest risk because of their position and period of training are F1 and F2 medical trainees and those beginning specialist training. Other newly qualified healthcare professionals may also benefit.

> **Recommendation** – Maximise the opportunity for enhancing patient safety through prioritising simulation access for newly qualified healthcare practitioners.

Conclusion 4 – Enhanced teamwork through simulation

While it was felt generally that doctors particularly would benefit from enhanced simulation access, it was equally observed that teamwork among clinical groups would benefit significantly through simulation – what was referred to as 'human factor' training. This focus on enhanced teamwork using simulation facilities will provide access to a wider range of clinicians, and have a tangible output that enables more effective communication, improves teamwork itself, and lowers risk factors.

Scale was highlighted as an issue in some respects concerning the size of teams that could benefit from simulation facilities, but we were provided with examples of team exercises both around major events and at service delivery level. Simulation is therefore a vehicle for enhanced teamwork to deliver patient safety, and this can be carried out at a more local level in future, aided by enhanced technology.

> **Recommendation** – Prioritise further simulation opportunities to develop teamwork at a work-based level.

Conclusion 5 – Develop simulation faculty

Simulation-based education is only as good as the faculty that carry out the scenarios and, importantly, provide the feedback. A number of centres are in the process of increasing the number of faculty in order to provide both the spread of numbers required, and the consistency of education experience they offer.

This training process is in itself assisted by simulation facilities, but the difficulty is not so much the willingness of those to take part, but the fact that this time is largely absent from job plans. These control documents significantly dictate what can be carried out and how time is used, so if faculty simulation facilitation and training is not in the job plan, then from the trust perspective, as employer, it does not exist. This inconsistency, therefore, needs to be addressed.

> **Recommendation** – Include reasonable simulation provision in job plans, and recognise its contribution to patient safety and reduced risk to trust service provision.

Conclusion 6 – Internal consistency

Consistency in training of both faculty and participants is a high priority. Trainees were described as 'migrants', and it is acknowledged that they require a largely consistent experience through the offering of both faculty and facilities across East Midlands. Simulation itself can have a role in this consistency, for instance in building on the generic induction package currently in place to enable both consistency of training for trainees and faculty.

Moving beyond induction, consistency is highlighted as central across many aspects of the whole job, again driven by the priority for patient safety. From a commissioning perspective, consistency will also be important in delivering value for money. However, absolute consistency across everything is an unattainable ideal, so it will therefore be essential to prioritise both the depth and breadth of consistency in simulation-based education and facilities.

> **Recommendation** – Agree the baseline level of consistency for faculty, facilities and processes vis-à-vis simulation across East Midlands and aspirations for continuous improvement.

Conclusion 7 – East Midlands simulation network

Given constraints on resources and the need to prioritise access to enhance outcome, a universal recognition was the need to develop a simulation network across East Midlands. Progress made in Scotland was highlighted in a number of quarters, with a network infrastructure seeming to benefit resource availability and use, maximise available skills and facilities, and integrate processes through what was often referred to as a 'hub and spokes' model.

The expectation of commissioners, in line with the principle of system alignment, will be to work together effectively. There will, of course, be vested interests that need to be considered in developing this network, though there was universality across stakeholders from academia and the NHS that this approach would be beneficial.

> **Recommendation** – Establish a network across East Midlands to maximise the use of simulation-based education facilities, linking into improved clinical skills training, and consider the role of the Deanery in leveraging this development.

Conclusion 8 – Outcome of simulation use

There is general recognition of the indirect causal link of simulation provision and patient safety, but as is shown earlier in Section 7, the evidence is still scant. However, the Francis Inquiry has ensured that patient safety is a significant item on board agendas, and anything that improves patient safety, such as simulation, will get greater consideration in board discussions in future. For commissioners, this evidence may be important in attaining buy-in to simulation, where it can be clearly shown to deliver towards their patient safety objectives.

East Midlands, building on its evolving simulation network, has the opportunity to put in place the research infrastructure that delivers evidence of impact, which in turn would reinforce the case for simulation-based facilities in education.

> **Recommendation** – The Deanery to take the lead in working with providers to put in place a research infrastructure that delivers further evidence of impact.

Conclusion 9 – Strategy development

A common thread through the review was the support for the development of a strategy for simulation provision in East Midlands. A number of key issues are apparent to reflect in the strategy, such as networking as the basis for maximising resources and enabling access, developing consistency across the region in both training and provision, and prioritising application to improve patient safety.

> **Recommendation** – The Deanery to reflect these review findings in its strategy to inform prioritisation and decision making.

In summary, these conclusions and recommendations should not be taken separately, but rather as an integrated suite of actions to move forward simulation-based education across East Midlands.

Frontline Consultants
April 2010

Appendix 1

Survey Questionnaire

Review of simulation-based education in East Midlands

1. Review of Simulation-based Education in the East Midlands

* 1. Please tell us:

Your name:

Your organisation's name:

2. Have you recently participated in the Department of Health's nationwide study of simulation activity?

- ◯ Yes - I completed a short, 1 page, questionnaire
- ◯ Yes - I completed an extensive questionnaire
- ◯ No - I was approached but did not participate
- ◯ No - I was not approached and did not participate

3. What is your primary role within healthcare education and staff development?

- ◯ Administrator or Manager of educational facilities and resources
- ◯ Deanery Training Programme Lead or University Educational Lead
- ◯ Workforce Development or HR Lead
- ◯ Director of Education (or similar) within a given institution or organisation
- ◯ Educational provider within a given institution or organisation

If you have any secondary roles within healthcare education and staff development, including the roles mentioned above, please list these roles here

4. In which healthcare sector is your institution, organisation or training programme primarily based?

- ◯ Pre-hospital care (e.g. Ambulance Service, Out-of-Hours Walk-In Centres, etc.)
- ◯ Primary care (including Community Care Hospitals)
- ◯ Mental health
- ◯ Other community practice (e.g. Dental, Social Services)
- ◯ Hospital based (including acute and non-acute healthcare provision)
- ◯ Commissioning
- ◯ Other (please specify)

Review of simulation-based education in East Midlands

2. Questions for providers of simulation-based training

1. Within your institution, organisation or training programme, is access to simulation-based educational resources administered and managed by:

- ◯ a single, central educational department or committee
- ◯ co-dependent leads dispersed throughout the organisation or training programme
- ◯ individuals who support local resources independent of the wider education and training scheme
- ◯ Other (please provide details below)

2. How often do staff, trainees or students in your organisation or under your remit for training currently access the following broad categories of simulation in order to enhance their learning or development?

	Frequently (several times a year)	Infrequently (annually)	Rarely (One-off or opportunistically)	Never
Table top 'paper-based' simulations	◯	◯	◯	◯
Role playing by learners	◯	◯	◯	◯
Use of live simulators or actors	◯	◯	◯	◯
Specific task or procedural training devices	◯	◯	◯	◯
Advanced computer-driven full body mannequins	◯	◯	◯	◯
Computer screen-based simulations	◯	◯	◯	◯

3. Where applicable, in what type(s) of environment are your staff, trainees or students able to access these simulation-based education & training modalities?
(please select all applicable options)

	Table top 'paper-based' simulations	Role playing by learners	Use of live simulators or actors	Specific task or procedural training devices	Advanced computer-driven full body mannequins	Computer screen-based simulations
Seminar, classroom, etc.	☐	☐	☐	☐	☐	☐
Local Clinical Skills facility	☐	☐	☐	☐	☐	☐
Local advanced simulation training facility	☐	☐	☐	☐	☐	☐
Distant (regional) advanced simulation training facility	☐	☐	☐	☐	☐	☐
National Clinical Skills facility or advanced simulation facilities	☐	☐	☐	☐	☐	☐
Resources within workplace or actual clinical environment	☐	☐	☐	☐	☐	☐

Please provide any further comments you have regarding the accessibility of simulation-based training in the space provided below

4. Please list ALL equipment and resources currently available within your organisation to support simulation-based training

5. Which of the following domains of learning (ie Knowledge, Skills, Behaviours) are currently addressed in your institution or training programme through the use of these modes of simulation? (please select all applicable options)

	Table top 'paper-based' simulations	Role playing by learners	Use of live simulators or actors	Specific task or procedural training devices	Advanced computer-driven full body mannequins	Computer screen-based simulations
Knowledge: conceptual understanding (making topics 'come alive')	☐	☐	☐	☐	☐	☐
Basic clinical skills: introductory consultation, communication, clinical assessment skills, simple practical skills, invasive procedures	☐	☐	☐	☐	☐	☐
Advanced clinical skills: challenging consultation, communication skills, complex or higher risk psychomotor skills, central venous cannulation, chest drain insertion, basic – advanced surgical skills	☐	☐	☐	☐	☐	☐
Non-technical and cognitive skills: Leadership, team working, clinical reasoning, decision making, situation awareness, reflection or meta-cognition	☐	☐	☐	☐	☐	☐

6. For what types of outcome do you use simulation within your organisation or training programme(s)?
(please select all applicable options)

	Table top 'paper-based' simulations	Role playing by learners	Use of live simulators or actors	Specific task or procedural training devices	Advanced computer-driven full body mannequins	Computer screen-based simulations
Education: improving conceptual knowledge, preparation for procedural skills or clinical activity	☐	☐	☐	☐	☐	☐
Training: practising actual tasks and rehearsal of workplace-based activity	☐	☐	☐	☐	☐	☐
Selection into training or substantive posts	☐	☐	☐	☐	☐	☐
Assessment & demonstration of competence including induction and mandatory training requirements and summative assessment of performance	☐	☐	☐	☐	☐	☐
Clinical rehearsal as adjunct to actual practice ('skills, drills & protocols')	☐	☐	☐	☐	☐	☐
Research into individual, team or organisation practices	☐	☐	☐	☐	☐	☐

Please provide details of any other outcomes which you use simulation training to achieve

7. What level of benefit or impact drives the need for access to simulation-based resources in your institution or training programme?
(please select all applicable options)

	Table top 'paper-based' simulations	Role playing by learners	Use of live simulators or actors	Specific task or procedural training devices	Advanced computer-driven full body mannequins	Computer screen-based simulations
Learning for the individual student or staff member	☐	☐	☐	☐	☐	☐
Interprofessional learning in broad terms	☐	☐	☐	☐	☐	☐
Team-based learning and leadership development within specific areas of clinical practice	☐	☐	☐	☐	☐	☐
Organisation-wide or programme–wide improvement	☐	☐	☐	☐	☐	☐

Please provide details of any other impacts which you believe are achieved from simulation-based training

8. What is the level of experience of students or staff in your organisation or training programme who have access to these simulation modalities? (please select all applicable options)

	Table top 'paper-based' simulations	Role playing by learners	Use of live simulators or actors	Specific task or procedural training devices	Advanced computer-driven full body mannequins	Computer screen-based simulations
Consultant, Senior Nurse,Midwife or Allied Health Professional	☐	☐	☐	☐	☐	☐
Healthcare Manager or Executive Director	☐	☐	☐	☐	☐	☐
Experienced postgraduate trainee or member of clinical staff	☐	☐	☐	☐	☐	☐
Novice or inexperienced postgraduate trainee or member of clinical staff	☐	☐	☐	☐	☐	☐
Undergraduate or pre-registered student	☐	☐	☐	☐	☐	☐
Secondary School Education	☐	☐	☐	☐	☐	☐

9. Which healthcare staff disciplines or professions in your organisation or training programme have access to these simulation modalities? (please select all applicable options)

	Table top 'paper-based' simulations	Role playing by learners	Use of live simulators or actors	Specific task or procedural training devices	Advanced computer-driven full body mannequins	Computer screen-based simulations
Medical	☐	☐	☐	☐	☐	☐
Nursing & Midwifery	☐	☐	☐	☐	☐	☐
Allied Health Professions	☐	☐	☐	☐	☐	☐
Clerical, admin or support staff	☐	☐	☐	☐	☐	☐

10. Who acts as faculty or educators when developing or delivering the simulation-based educational activities of which you have experience? (please select all applicable options)

☐ Dedicated local clinical educators or trainers employed specifically to support this activity

☐ Experienced local clinical staff released from other service duties on an occasional basis

☐ Experienced clinical staff based in other organisations across the NHS East Midlands

☐ Educators or trainers from organisations outside the NHS East Midlands

11. To what extent do you think existing clinical educators, faculty, or dedicated trainers in your organisation or training programme access the following choices of accredited or quality assured professional development programmes in order to advance their ability to make the most effective use of simulation-based resources for learning in healthcare?

(Indicate your response on the (Likert) scale provided where 1 = never, and 6 = guaranteed and part of professional development process

	1	2	3	4	5	6
University or Higher Education based Educator development courses	◯	◯	◯	◯	◯	◯
Local Trust or Healthcare Provider based Educator development courses	◯	◯	◯	◯	◯	◯
Distant institutional accredited Educator or 'Train the Trainer' development programmes	◯	◯	◯	◯	◯	◯

12. To what extent do you think that more comprehensive and equitable access to the full spectrum of simulation-based healthcare education and training will help achieve the following goals

(Indicate your response on the (Likert) scale provided where 1 = no impact whatsoever, and 6 = significant positive impact)

	1	2	3	4	5	6
Assurances regarding individual clinical competence of all qualified healthcare staff	◯	◯	◯	◯	◯	◯
Enhanced education and training for clinical staff by optimising learning from clinical experience	◯	◯	◯	◯	◯	◯
Significant improvements in patient safety	◯	◯	◯	◯	◯	◯
Significant service improvements and care pathway planning	◯	◯	◯	◯	◯	◯
Better workforce recruitment, development and retention	◯	◯	◯	◯	◯	◯
Other (please specify below)	◯	◯	◯	◯	◯	◯

Other (please specify here)

13. Given the breadth of available simulation-based approaches to support learning and development that are currently feasible, and considering any gaps that you can identify or perceive in the local or regional provision of such educational resources, what would be your 3 top priorities to be considered by any East Midlands wide strategy for developing and supporting simulation-based healthcare education?

Priority #1

Priority #2

Priority #3

3. Questions for commissioners

1. As a commisioner of healthcare services, what importance do you attribute to providers' capacity to provide simulation-based training?

(Please respond using the (Likert) scale provided, where 1 = capacity to provide simulation training is unimportant/not considered, and 6 = capacity to provide simulation training is extremely important/highly prioritised amongst considerations)

◯ 1 ◯ 2 ◯ 3 ◯ 4 ◯ 5 ◯ 6

2. As a commisioner of healthcare services, do you think that more comprehensive and equitable access to the full spectrum of simulation-based healthcare education and training will help achieve the following goals:

(Indicate your response on the (Likert) scale provided where 1 = no impact whatsoever, and 6 = significant positive impact)

	1	2	3	4	5	6
Assurances regarding individual clinical competence of all qualified healthcare staff	◯	◯	◯	◯	◯	◯
Enhanced education and training for clinical staff by optimising learning from clinical experience	◯	◯	◯	◯	◯	◯
Significant improvements in patient safety	◯	◯	◯	◯	◯	◯
Significant service improvements and care pathway planning	◯	◯	◯	◯	◯	◯
Better workforce recruitment, development and retention	◯	◯	◯	◯	◯	◯

3. As a commisioner of healthcare services, please indicate your satisfaction with the following:

(Please use the (likert) scale provided below where, 1= Very dissatisfied, and 6= Very satisfied)

	1	2	3	4	5	6
Accessibility of simulation-based training to different staff groups across the East Midlands	◯	◯	◯	◯	◯	◯
Accessibility of simulation-based training to different levels/seniority of staff across the East Midlands	◯	◯	◯	◯	◯	◯
Accessibility of simulation-based training to different sub-regions within the East Midlands	◯	◯	◯	◯	◯	◯
Equipment and resources currently available for delivering simulation-based education to develop staff.	◯	◯	◯	◯	◯	◯

4. As a commisioner of healthcare services, are you aware of any gaps in, or barriers to, the provision of simulation training in the East Midlands?

- ◯ Yes
- ◯ No

If you are aware of any gaps or barriers, please give details below:

5. As a commisioner of healthcare services, what would be your 3 top priorities to be considered by any East Midlands wide strategy for developing and supporting simulation-based healthcare education?

Priority #1

Priority #2

Priority #3

4. Contact times and dates

1. SURVEY COMPLETE

Thank you very much for taking the time to contribute to the review. Your response is extremely helpful and will help us to understand the shape of current and future simulation provision within the East Midlands. As you may be aware, this review aims to directly inform the development of the simulation strategy for the East Midlands and your input is vital to ensuring that this strategy is meaningful for you.

Following the analysis of your responses, we may like to speak to you to discuss any issues or areas of interest emerging from these findings.

If you have not already arranged a time to speak with a representative of the review team, please provide details of times and dates when you would be available to take part in further discussion if contacted. If you are selected to take part in further discussions, a member of the review team will then get in touch with you to confirm the time and date at which you will be contacted.

Please note that telephone interviews will be conducted from Monday 8th March February – Friday 12th March. Use the boxes below to provide details of your contact telephone number and the most appropriate times and dates for the review team to contact (please specify time and date in the format DD/MM, XX:XX

Telephone number:	
Contact time/date 1:	
Contact time/date 2:	
Contact time/date 3:	
Contact time/date 4:	
Contact time/date 5:	

Appendix 2

Equipment Detailed in Responses to e-Survey

Full body mannequin/full immersion resources

- Regional Simulation Centre and clinical skills Centre which are on site. SIM baby available when staff time permits to use in the workplace.
- Simulation lab with high definition mannequin and one portable paediatric model
- Advanced computer driven mannequins based primarily within TSCSC but others exist in separate clinical units (eg paediatric ICU, Burns Unit); live simulators used primarily in TSCSC as part of 'full immersion' simulation scenarios, but commissioned occasionally for use in classroom settings
- Simulation scenarios prepared by our organisation
- Meti Man and Paed. Laerdel SIM baby and paed with full curriculum OCB media computer based simulation; simulation centre allowing procedural simulations
- Medium fidelity simulators x2, clinical skills centre with video facilities; in-theatre video and live screening in gynaecology theatre
- High fidelity computer based simulators
- Use the high fidelity simulator ISTAN [university owned]for the F2 trainees although this is a foundation school project rather than the anaesthetic school as such
- We have 2 sim men 1 based at LRI and 1 at NGH
- Advanced computer-driven full body mannequin available within school which is used by individual trainers to aid teaching
- Most resources are within the Trent regional simulation centre
- Adult and Paediatric advanced life support simulators, purpose designed ambulance saloon with CCTV and widescreen remote viewing
- Hardware: Access to PICU Sim Baby; due to acquire SimNewbie via EM neonatal business case that we wrote. Have Gaumard newborn HAL as our wireless high fidelity simulator; we run 6 NLS courses a year in Leicester and have full kit for these along with multiple task training mannequins
- Advanced patient manikins adult x 3 advanced patient manikin child x 1 advanced patient manikin baby x 1
- Scenarios and clinical suites (set up to replicate a clinical ward environment)
- New centre with £G Simman and Simbaby about to go live
- Clinical/ ward environments for role play/training
- We have a dedicated clinical skills unit which is full ward size
- Yelvertoft: A mock up of a hospital ward containing 4 hospital beds
- Kelmarsh 209: Child simulation area, containing 1 cot and 1 hospital bed
- Kelmarsh 105: Occupational Therapy bedroom.
- Kelmarsh 109: Occupational Therapy bathroom
- Kelmarch 111: Occupational Therapy Kitchen
- Lamport 104: Dental Suite containing the dentist chair, x-ray and camera facilities
- Lamport 110: Paramedic suite, containing a modified ambulance which has been redesigned to enhance it's effectiveness in simulation training
- Fully equipped clinical skills suite comprising, kitchen, bathroom, bedroom, ward set-up, orthotics suite, range of moving and handling equipment, video / DVD / audio recording facilities, Wimba classroom, studio production of video clips etc
- SIMMAN owned by the School of Anaesthesia Simulation centre in the hospital
- Vascular interventional simulator Arthroscopic simulator Laparoscopic simulator
- a full body computer driven mannequin
- 3G laerdal medium fidelity simulator
- Mannekins - sim man
- Ambulance METI Simulators - HPS ECS Paed BabySim Laerdal SimMan Ventilator Infusion Pumps x 3 Datex - Ohmeda Anaesthetic Machine & Monitor De-fibb Foetal Monitor Bypass Machine Evolution Bed & Mattress Multi Purpose Chair Surgical Table Trolley x 8 Operating Light Digital Transceiver Radio's x 4
- Have the resources of a Advanced simulation centre, two clinical skills labs, and the equipment necessary to support NLS, APLs, GIC, ALS & APLS courses
- 1 simbaby (Laerdal) 2 simen (laerdal) 1 Metiboy HPS 2 ISTAN Mobile simulation cart Metivision

Part task trainer resources

- Clinical skills centre far distanced from clinical area.
- Procedural task simulators dispersed throughout the organisation and purchased / used independently by many different users / education providers
- Airman Laerdal simulator for airway teaching
- External Defibrillation training device
- We have no electronic human simulators, we have various resus dummies and training arms but other wise nothing that would contribute to simulation based training neither do we have a dedicated computer suite for clinical training.
- Vascular mannequin; cross-sectional biopsy & venous access mannequins in business plan
- clinical skills centre with video facilities. In theatre video and live screening in gynaecology theatre. Microscopes with teaching attachments widely used
- Use of models available locally e.g. for joint injections, gynae exams; use of resuscitation models - usually at local hospital provide by resuscitation officers, etc
- Many to list including low fidelity venepuncture arms etc and resus manikins
- In addition we have various mannequins for practice intubation of difficult airways etc; we have access to the clinical skills dept at the LRI but this is some distance from theatres and often lacks availability
- We have a surgical skills laparoscopic training unit
- Airway mannequins and fibreoptic training devices available for use.
- I can only comment on this one department not the whole organisation. This is not an extensive list: part task trainer s- e.g canulation arms, chest drain simulator surgical & lap simulators x 10 endoscopy simulator x 1
- Long list, computers, videos, CBDs, Dry bones, Computer simulators, Model simulators etc
- No centralised single resource currently available; courses are available for pacemaker wire and chest drain insertion
- Laerdal training mannequins. Injection pads, mannequins specific anatomical models (eg canulation arms/ intubation heads/ chest decompression chests)
- Written Scenarios Ward based resuscitation equipment Simple resuscitation dolls
- Local trusts have equipment for basic clinical skills
- Full clinical skills units at all of the Acute Trusts which take our medical students
- Mannequins, simulation centre, procedural models, animal prosections
- Mannequins, prostheses
- Airway mannequins
- Clinical and anatomical models, clinical equipment that can be found in a live clinical environment (beds, hoists, ECG monitoring, Spirometery, BP measurement equipment, Temperature measurement equipment, peak flow meters, blood glucose meters, a suction machine)
- CVC access part task trainers laparoscopic surgery part task trainers LP part task trainers fibreoptic intubation part task trainers temporal bone lab suturing part task trainers
- Lap boxes endoscopy simulator etc
- Low fidelity training devices to cover all aspects of clinical skills

Desktop, computer-based resources

- Computer desktop-based learning packages purchased / available in a similar pattern to above but even more dispersed and less well identified
- NILE links to Web based resources
- Workbooks, power-point presentations, School intranet with online quizzes and video material
- Minimal computer based simulation only
- Adobe connect based e-learning
- Variety of online resources
- Computers, as I'm not sure what is needed cannot answer this question fully
- E-learning, case studies
- We have computer based ISTANs and babies
- Blackboard (virtual learning environment)
- PBL cases (which is what I mean by 'paper-based' simulations above, even though these are delivered on a virtual learning environment)

Live simulators/actors

- Simulators trained by our organisation
- well developed low-fi simulated patient group of actors
- Use of role play in one to one and group teaching Use of simulators from Simulated Patient Unit in Nottingham
- Use of table top simulations e.g. GP practice management course
- patient simulators x 30
- Professional actors (not resident but brought in)

Faculty resources

- We have trained clinical skills facilitators who are used to writing and running simulation
- We are currently developing training for faculty to be able to run simulations
- Team of consultants and nursing instructors, mostly trained by Harvard University Simulation team and Nottingham Trent Skills centre led by 2 consultants with masters degrees in education.
- 30 trained faculty for debriefing 2 technicians 12 clinical skills facilitators inclusive of resuscitation.

Appendix 3

Priorities for Simulation-Based Education in East Midlands

#2 Priorities for Providers

Networking

- Harness expertise from educators and individuals who understand pedagogical principles
- Managed network sharing and developing simulation-based activity
- Establish a faculty of educators that work across all trusts
- Co-operative working between simulation centres

Facilities

- More simulated patients
- Acknowledgement of the importance of this type of training
- Provide resources both for simulators and developing simulation centre facilities
- Dedicated simulation training centre adequately funded

Time

- Facilitation of attendance
- Protected time – staff cannot be made to work clinically at last moment
- Ensure sufficient staffing to allow work based simulations to occur
- Dedicated time and protected PAs for consultant staff who lead simulation

Money

- Facilitation of attendance
- Provide resources both for simulators and developing simulation centre facilities
- Streamed funding to specifically support this type of education at teaching institutions to ensure wide access for all
- More secure funding arrangements
- Simulation resources
- Funding to maintain current resources
- Resources
- Dedicated simulation training centre adequately funded
- Free and monitored access

Faculty

- Education Fellow funding – need more trained and credible teachers
- Development of faculty so there is a body of people who can support this and it becomes embedded into training programmes
- Training of simulator staff and educators
- Establish a faculty of educators that work across all trusts
- Ensure sufficient staffing to allow work based simulations to occur
- Improved education of educators to use variety of simulation methods
- Train local faculty using existing and new trainers
- Dedicated faculty to deliver all levels of simulation based training for all staff groups inclusive of pre-reg and post reg education
- Dedicated time and protected PAs for consultant staff who lead simulation

Strategy

- Equitable implementation of the strategy throughout the East midlands
- liaise with Royal Colleges re validation and role of simulation for formative assessment
- A mapping of current simulation resources within NHS and education institutions across the region
- A strategy to deliver genuine multi professional sessions
- Sharing capacity wherever available to economise on resourcing

Location

- Streamed funding to specifically support this type of education at teaching institutions to ensure wide access for all

Course Content

- Opportunities for inter-professional learning based around decision making and evidence-based leadership skills
- Health promotion and prevention – infection control
- A strategy to deliver genuine multi-professional sessions
- Rehearsal at critical educational phases, eg graduation, post-fellowship
- Percutaneous non-vascular access (urinary & biliary)
- Inter-professional learning programmes
- Development in leadership and team-working skills in not only doctors on training but with a multi-professional focus
- All forms as mentioned above are integrated
- Optimise ward based team training
- Medical devices and equipment
- Self-directed learning packages for all trainees

#3 Priorities for Providers

Networking

- 'Hub & spokes' type model for central facilities with expertise and distributed resources for better access
- Develop regional steering committee of these champions who would share their ideas and experience for taking simulation training forward in the region
- A collaboration between all NHS and education institutions across the region using a regional forum

Facilities

- Adequate resources – especially space for carrying out sessions and proper 'buy in' from trusts (will be difficult during an era where quality takes a second place to cost saving)
- Improved access to simulated patients
- Increased mobility to allow multi-site work based simulations

Time

- Time set aside for education and development
- Release of key staff to train

Money

- Funding for new resources
- Funding
- Clarity of commissioning patterns and equity of funding across providers
- Identification of gaps in specialist facilities to target spending of resources
- Transparent process of contracting educational programmes

Faculty

- Tutor training
- Development of an accredited training programme for technicians to help support simulation training
- Ensure trained and dedicated staff
- Funding and education of trainers in utilising these resource

Strategy

- A time-line for embedding the principles of simulation in the community, mental health and secondary health care that is tied to the business planning process
- Identified areas for educational research and support to do this
- 'Hub & Spokes' type model for central facilities with expertise and distributed resources for better access
- Research – need re validation of assessment procedures
- Develop regional steering committee of these champions who would share their ideas and experience for taking simulation training forward in the region
- National standards for advanced simulation training
- Research development of the delivery of curriculum and linking to benefits in practice for a safe and quality patient journey
- Identification of gaps in specialist facilities to target spending of resources
- Better understanding of the juxtaposition of high fidelity and 'live' simulation

Location

- Develop a hi-fi centre in the centre of the South East Midlands

Course Content

- Awareness
- Integrated computer packages and scenario-based
- Effective team working
- Radiology role in team decisions prior to on-call
- Assessment
- Difficult communication with regards to failing trainee or trainer
- Statutory training, management of risk and investigations