Paediatric research environment in the UK

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Abstract
Clinical research is essential in order to ensure that children receive the best possible treatment in the most appropriate manner. Paediatric research in the UK is mainly focussed on clinical trials. These are facilitated by networks such as the Medicines for Children Research Network. Child mortality rates in the UK are significantly higher than many other European countries. There is insufficient research in the UK into healthcare delivery for children. The most important outcomes in relation to research in children should be a reduction in child mortality rates and a reduction in child morbidity.

Keywords children; clinical trials; research

Introduction
Clinical research provides the scientific evidence that assists health professionals in ensuring that patients receive the best possible treatment. Research can evaluate different types of interventions. These can be medicinal products, surgery, therapies (such as physiotherapy, speech therapy or occupational therapy) or diet. Research can also evaluate the systems used to ensure that patients receive treatment. The aims of clinical research in children are:

- To prevent illness or death
- To detect illness earlier
- To treat illness more effectively
- To minimise the side effects of intervention

Research can also be laboratory based and look at mechanisms of action of different medicines or diseases. This includes the influence of genotype on both the disease and treatment.

Universities and academic departments of child health
Historically academics have been at the forefront of research in child health. Unfortunately, within the UK there has been a decrease in the number of departments of child health. Additionally, there are difficulties in recruiting to academia. One of the major factors in discouraging junior doctors into academia has been the increased pressure to publish in journals with a high numerical impact factor. This is partly related to the research assessment exercise that is performed by the government. This is an evaluation of all types of research within universities and is an administrative measure used to determine how government research funds should be allocated to different universities. Unfortunately, many senior academics have supported the research assessment exercises. This is despite the fact that there is no evidence basis that it improves research outputs. Additionally, clinically research assessment does not evaluate clinical outcomes. Research assessment also unfortunately detracts a lot of active researchers in administrative duties both in evaluating research and also in trying to ensure that researchers’ own academic institutions receive significant amount of funding.

There have been important initiatives in encouraging junior doctors to become academics. Academic Clinical Fellowships were established in 2006. These allow junior doctors to spend 25% of their time in research. These trainees are likely to be the academics of the future. One of the disadvantages of the Academic Clinical Fellowships is that trainees have to apply early on in their training (usually at specialty training levels 1–3). This means that the trainee who has enjoyed working clinically and during their training recognises the importance of research, often finds it more difficult to become an academic.

Health professionals within the NHS have also played a major role in clinical research. Unfortunately, with an increasing workload within the NHS, health professionals are finding it more difficult to be involved in research projects. Clinical trials within the NHS in children have however increased and this will be discussed in greater detail later on in the article.

NIHR
The National Institute of Health Research (NIHR) plays a vital role in both promoting and co-ordinating research in the UK. The NIHR consists of different programmes each of which funds a different type of research (see Box 1). The main programme within NIHR is the Health Technology Assessment (HTA) programme. The Efficacy and Mechanism Evaluation (EME) programme is specifically aimed at technologies which have not been used extensively and for which there is little evidence. Examples of public health research in relation to children include systematic reviews of the effects of schools and school environment interventions on health and the delivery of effective teacher training to promote health and wellbeing in schools.

The NIHR HTA programme has been in existence for over 20 years. The HTA funds both researcher-led and commissioned research into the effectiveness of different technologies. Technologies include different types of interventions. These include:

- Medicinal products
- Surgical interventions
- Medical devices
- Diet
- Physiotherapy
- Speech therapy
- Occupational therapy

Most research is investigator-driven. These are clinical ideas that the investigator is particularly interested in and wishes to study. Investigator-driven research accounts for the majority of clinical research that is undertaken in children in the UK. Unfortunately, researchers have neglected many different diseases and disease areas. Mental health problems are one of the main causes of morbidity in children and young people. There is however
Any individual or organisation can suggest an area of research. In order to ensure that research occurs in clinically important areas where there has been little investigator-driven research, the NIHR will commission research. The NIHR HTA allocates more of its research funds to commissioned research than investigator-driven research in order to compensate for the fact that research in certain areas has been relatively neglected. Examples of commissioned research that have had a significant benefit on children are shown in Table 1. The research commissioned by the NIHR HTA includes both clinical trials and evidence syntheses. It involves both common conditions such as childhood eczema, fever, diabetes and sleeping problems with children with neurodisabilities as well as rare conditions such as uveitis in juvenile idiopathic arthritis. It is important to note that the prevention of illness, i.e. promoting breast feeding or reducing fractures in juvenile idiopathic arthritis, are also important.

Suggesting a research idea

Any individual or organisation can suggest an area of research. These can be made via the NIHR HTA website (www.hta.ac.uk/).

The HTA programme has also funded many investigator-driven research projects that have evaluated different technologies and their effect on child health. The NIHR had a themed call on child health and medicines several years ago. This was in response to recognition that many medicines that were used in children were either unlicensed or used in an off-label manner. Several of these research projects have recently finished and are illustrated in Table 2.

Clinical trial networks

Clinical trials are essential in order to provide the evidence basis for the rational use of medicines in children. Over the last 15 years numerous studies have been published documenting the extent of unlicensed and off-label use of medicines in children. These publications resulted in concern by the professional organisations of health professionals looking after children. It has resulted in European legislation which encourages clinical trials of medicines that are likely to benefit children.

A major positive development in the UK has been the establishment of the Medicines for Children Research Network (MCRN) and the Scottish Children’s Research Network (SCRN). The MCRN and the SCRN were both established by the government in response to the recognition that the majority of medicines used in children were used off-label, i.e. there was a lack of scientific evidence for their use. Both the MCRN and SCRN work in a similar manner. They provide assistance to health professionals who are conducting clinical trials within the NHS. Prerequisite for the involvement of the network is that the clinical trial is funded by a national charity (this includes the NIHR) or by the pharmaceutical industry. The MCRN has been in existence for 7 years and has helped ensure recruitment to many trials. Many of the clinical trials funded by the NIHR (both commissioned and researcher-led) have received support from the MCRN.

The research governance of clinical trials has become more complicated over the last decade. Unfortunately, clinical trials run by health professional now have the same research governance requirements as clinical trials run by the pharmaceutical industry. This has resulted in significant delays in research. The MCRN and the SCRN both play a helpful role in relation to the research governance of clinical trials.

Safety and ethics in clinical trials

It is important that the clinical trials that are performed on children are of a high ethical quality. This means that invasive procedures need to be kept to a minimum. Additionally there needs to be a clear clinical justification for performing the clinical trial in paediatric patients. Unfortunately, information regarding the number of clinical trials that are turned down by ethics committees or declined in the UK is not well documented.