

More evidence to favour newborn screening for cystic fibrosis

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Newborn babies have been screened for cystic fibrosis in some regions for more than 25 years. Benefits have been unequivocally shown, yet screening remains controversial. In today's *Lancet*, Erika Sims and colleagues¹ report more evidence in favour of newborn screening for cystic fibrosis. In a well-designed study, they used data from the UK cystic fibrosis database for 2002 to compare the treatment costs of 184 children aged 1–9 years, who had cystic fibrosis that was identified by newborn screening, with those of 950 children in the same age-group who were identified after clinical presentation of the disease. The findings of this cohort study are clear: savings in the cost of treatment would offset actual costs of the screening programme as it currently exists in Scotland.

Cystic fibrosis remains a life-shortening disorder, but effective treatments are available and the outlook for patients has improved substantially over the past 25 years.² Why newborn screening for cystic fibrosis has taken so long to gain popularity is unclear. In the 1980s, those with a role in early screening programmes reported health benefits that were hard to ignore.^{3,4} In 1985, two randomised trials started in the USA⁵ and UK⁶ that assessed outcome in patients with cystic fibrosis who were identified by screening versus those who were identified clinically. Extensive reporting from the US trial showed that screening was associated with benefits in nutrition and growth⁷ and in cognitive function.⁸ Later, an Australian study⁹ showed pulmonary benefits with newborn screening, and another US study showed survival benefits.¹⁰

If clear clinical benefit does not always persuade governments to implement screening, cost benefits might. The costs of screening are an important part of such decisionmaking. Until now, as Sims and colleagues highlight, cost-effectiveness studies have mainly compared screening with other methods of diagnosis for cystic fibrosis, and have not investigated cost savings that might offset screening costs. Screening for cystic fibrosis has been done throughout Scotland since 2002 and uses an initial measurement of immunoreactive trypsin on a dried blood-spot, followed by a DNA test on samples with the highest levels of immunoreactive trypsin. Sims and colleagues compared the cost of this screening technique with savings in treatment costs for patients with cystic fibrosis who were identified by screening. The costs quoted for the screening test in Scotland seem high (US\$4.45 per baby screened). In our screening programme in New South Wales, Australia, incremental costs are about a third of this figure. If screening costs throughout the UK were to be lower than Sims and colleagues estimate, their finding that reduced treatment costs would offset screening costs would be strengthened.

A possible criticism of Sims and colleagues' study is that the children identified by use of newborn screening are not comparable with those identified by clinical presentation because the former probably includes more patients with mild disease, especially in the youngest cohort aged 1–3 years. However, when the researchers analysed only those who were homozygous for the common mutation that is associated with severe classic cystic fibrosis—Phe508del—they found a similar, but slightly less substantial, cost advantage for treatment of screened patients.

Other treatment costs are not addressed by Sims and colleagues' study. For instance, inpatient costs are a substantial proportion of total-care costs,¹¹ and various other types of cost are not captured by the data on the UK cystic fibrosis database. Nevertheless, the finding that the savings in major treatment would offset the costs of screening is persuasive. There are registries for cystic fibrosis in the USA, France, Australia, Germany, Ireland, and elsewhere. Sims' findings probably apply widely outside the UK, and similar studies in other countries might be useful.

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Screening for cystic fibrosis is quickly gaining ground in many countries where it may be relevant: there are at least 26 programmes in Europe,¹² and 27 states in the USA now screen, with a further four likely to begin soon.¹³ Newborn screening is done throughout Australia and New Zealand. Some parts of the world—eg, the middle east and possibly parts of India—have a high frequency of cystic fibrosis, and screening might have potential in countries with a stable health-care system.¹⁴ Nevertheless, it remains an enigma that newborn screening for cystic fibrosis has until now been so controversial, when there is so much evidence in favour. By contrast, newborn screening for other disorders, such as toxoplasmosis, has been accepted although evidence of benefit remains unclear.¹⁵

*Bridget Wilcken, Kevin Gaskin

Children's Hospital at Westmead, NSW 2145, and University of Sydney, Sydney, NSW 2006, Australia
bridgetw@chw.edu.au

We declare that we have no conflict of interest.

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Animal research: the debate continues

In 1875, Charles Dodgson, under his pseudonym Lewis Carroll, wrote a blistering attack on vivisection, which he circulated to the governing body of Oxford University, UK, in an attempt to prevent its establishment of a physiology department. Today, despite the subsequent evolution of one of the most rigorous governmental regulatory systems in the world, little has changed. A report¹ published at the end of 2006—*The use of non-human primates in research*—that was sponsored by the UK Royal Society, Medical Research Council, Wellcome Trust, and Academy of Medical Sciences attempts to establish a sounder basis for the debate on animal research through an in-depth analysis of the scientific basis for research on monkeys. In the UK, no great apes have been used for research since 1986.

Of 3000 monkeys used in animal research every year, 75% are for toxicology studies by the pharmaceutical industry.¹ Although expenditure on biomedical research

has almost doubled over the past 10 years, the number of monkeys used for this purpose (about 300) has tended to fall. The report, which discusses mainly the use of monkeys in biomedical research, pays particular attention to the development of vaccines for AIDS, malaria, and tuberculosis, and to the nervous system and its disorders. The report assesses the importance to global health of these issues, together with potential approaches that might avoid the use of animals in research. Other research areas are also discussed, together with ethics, animal welfare, drug discovery, and toxicology.

The report concludes that in some cases there is a valid scientific argument for the use of monkeys in medical research. However, no blanket decisions can be made because of the speed of progress in biomedical science (particularly in molecular and cell biology) and because of the available non-invasive methods for study of the brain. Every case must be considered individually