

# DeNDRoN: supporting new sites to become active in Motor Neurone Disease research

Hannah Hollinger<sup>1</sup>, Piers Kotting<sup>2</sup>, Kris Beicher<sup>5</sup>, Karen Morrison<sup>3</sup>, Ammar Al-Chalabi<sup>4</sup> & Pamela Shaw<sup>1</sup>

<sup>1</sup>Academic Neurology Unit, University of Sheffield, Sheffield, UK. <sup>2</sup>DeNDRoN Co-ordinating Centre, University College London, London, UK. <sup>3</sup>Queen Elizabeth Hospital, Birmingham, UK. <sup>4</sup>Kings College Hospital, London, UK. <sup>5</sup>DeNDRoN Co-ordinating Centre, Newcastle University, Newcastle, UK.

## Background

Motor neurone disease (MND) is an adult-onset neurodegenerative disease causing selective loss of motor neurones in the cerebral cortex, brainstem and spinal cord. This usually results in the patient presenting with muscle weakness in either the limb, bulbar or respiratory regions.

The aetiology of MND is unknown. In 5-10% of cases, the disease follows an autosomal dominant pattern of inheritance, with mutations in the SOD1 gene known to account for approximately one-fifth of these cases. Linkage studies have identified at least six other published loci associated with MND. Given that symptom onset generally occurs later in life, the resultant gaps in family history suggest the contribution of these and other genes is likely to be significant.

## MND DNA Bank & National Database

The MND DNA Bank and National Database is the most ambitious research project ever undertaken by the MND Association<sup>1</sup>. This £1million project aims to collect several thousand DNA samples and lymphoblast cell lines over five years. The resulting information will be used by research scientists as they investigate potential causes of, and possible treatments for, the disease.

Samples will be obtained from sporadic and familial MND patients attending MND clinics in the UK and the Republic of Ireland, their spouses (or other genetically unrelated controls) and blood relatives. The core of the collection will comprise of up to 1,500 sporadic ALS cases and 1,500 age and sex-matched controls, stored as frozen DNA and as EBV-transformed lymphocytes.

The project is collaborative in design, adopting a 'hub and spoke' model, with three Regional 'Hub' Centres Birmingham, London and Sheffield linking with a number of 'Spoke' MND Care Centres. The MND Association serves as custodian of material and clinical information and have recently launched a secure on-line database to increase efficiency of data collection and allow central analysis of data.

## Increasing 'spoke' centres through DeNDRoN

DeNDRoN's strategy for supporting MND research in England is to work with the MND Association Care Centres that are already research active and to develop appropriate infrastructure to enable increasing numbers of MND Association Care Centres to become research active. New sites have been brought on as 'spoke' sites for the MND DNA Bank. Since being established in 2006, DeNDRoN has helped to more than double the number of sites recruiting to the MND DNA BioBank (figure 1).

## Aims

To examine the impact on recruitment of DeNDRoN's policy of increasing the numbers of sites contributing to MND DNA Bank.

## Methods

Recruitment data from the original nine sites is compared to recruitment data from all sites.

## Results

The typical site recruitment profile is for high levels initially, slowing down once the majority of prevalent cases have been recruited. Recruitment at the initial 9 sites has slowed steadily during the project (figure 2). By opening increasing numbers of new sites, recruitment has been maintained at a relatively steady rate (figure 3). Overall cumulative recruitment to the MND DNA Bank has been maintained at a rate beyond that sustainable from the initial nine sites, with almost 2000 people donating their DNA by December 2009 (figure 4).

<sup>1</sup> MND Association website, accessed 14th January 2010: [www.mndassociation.org/research/research\\_explained/dna\\_bank/index.html](http://www.mndassociation.org/research/research_explained/dna_bank/index.html)

Figure 1: number of sites involved per year, 2006-2009

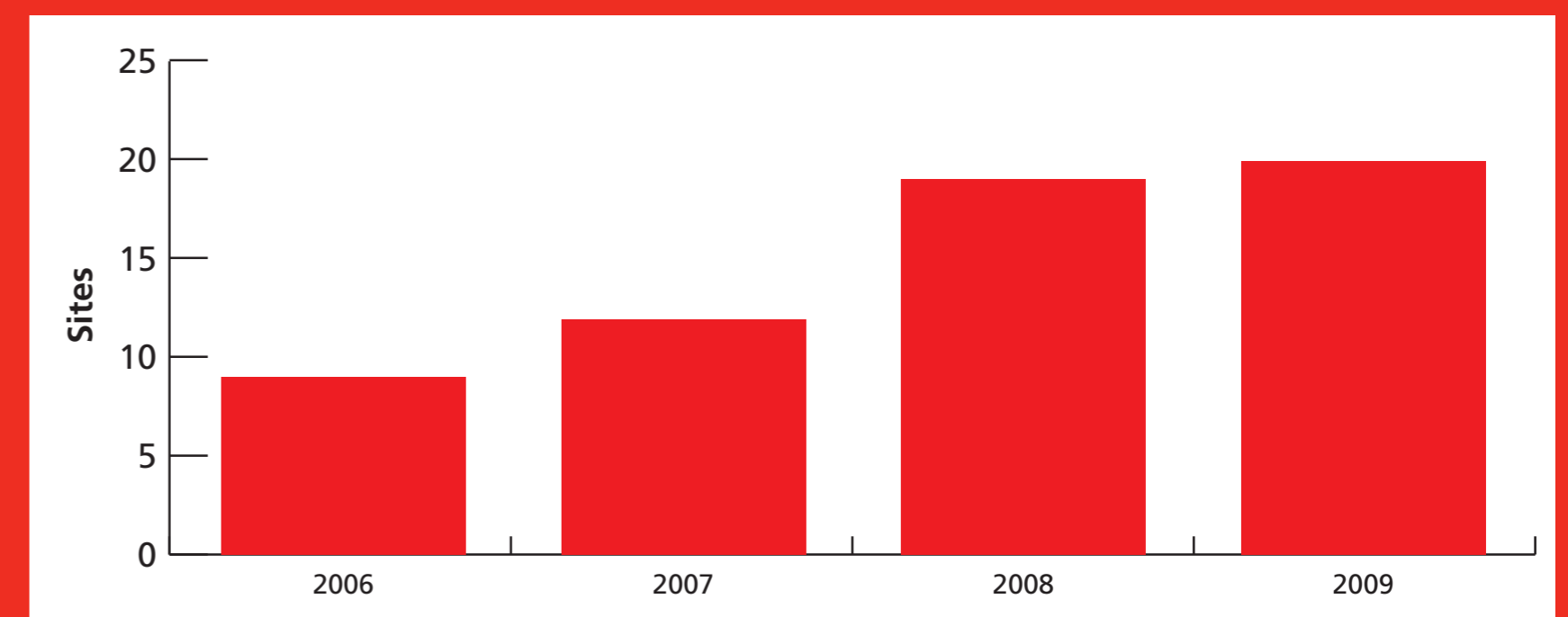


Figure 2: monthly recruitment at the initial 9 sites, and linear trend line

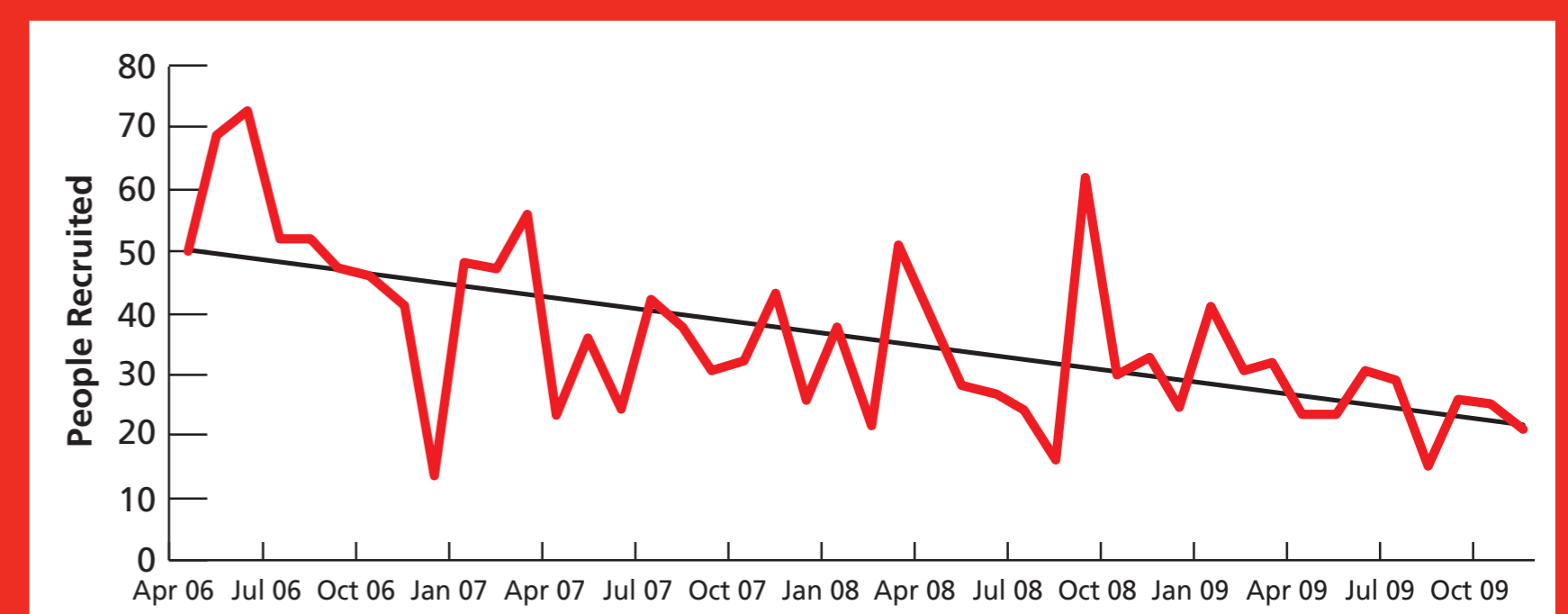
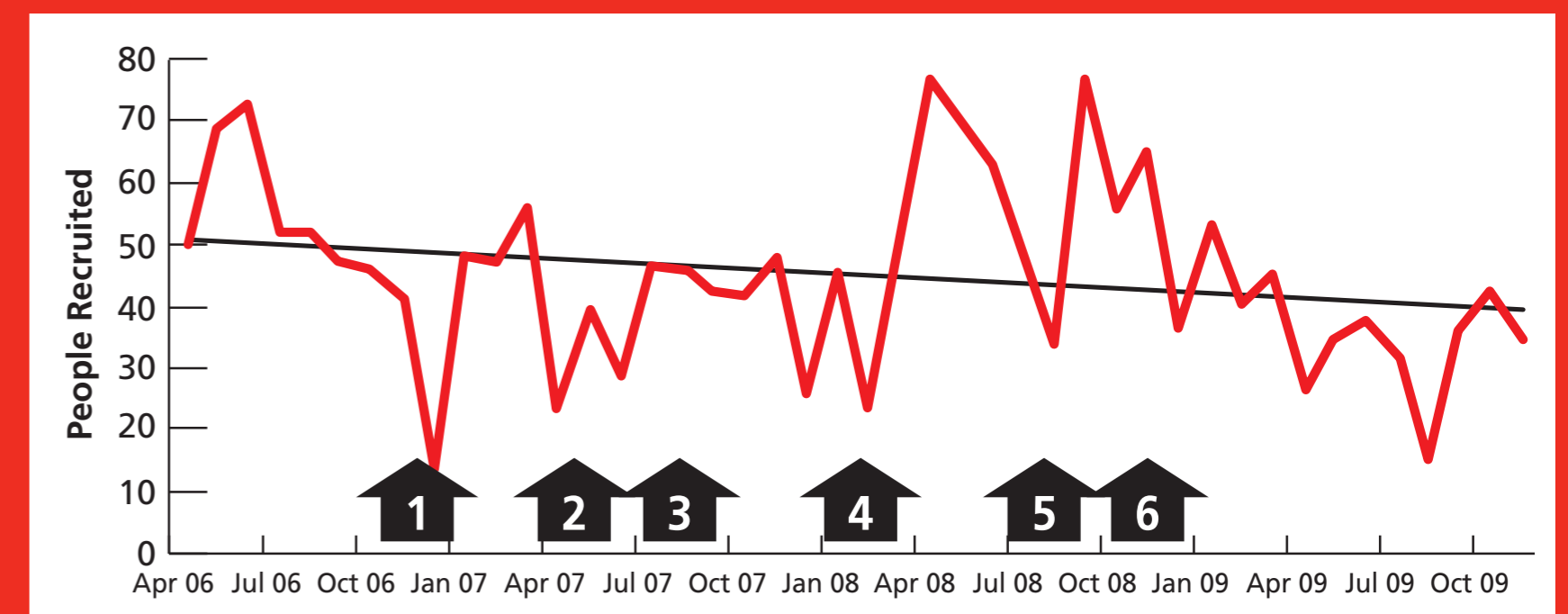
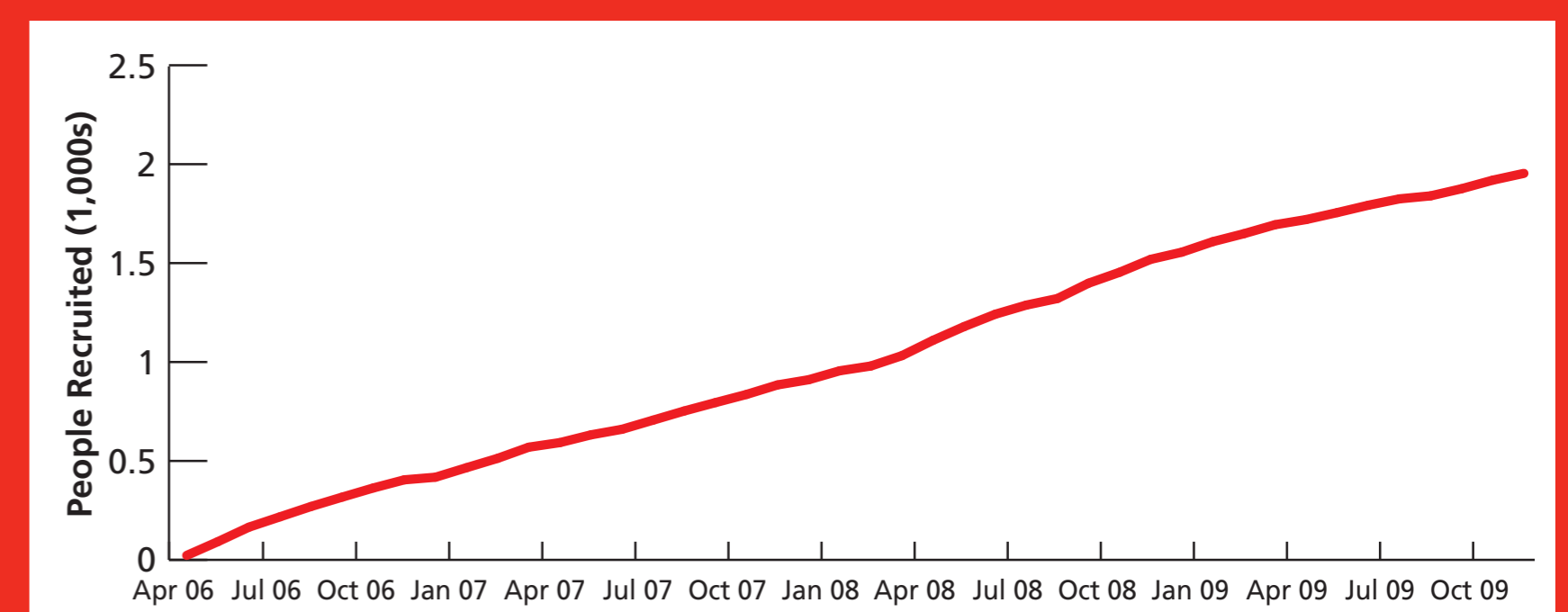


Figure 3: monthly recruitment at all sites, linear trend line, and dates of new sites opening



|   | Date       | Site(s) opening  |
|---|------------|--|
| 1 | Nov 06     | Walton Centre for Neurology and Neurosurgery (Pre-DeNDRoN support) |
| 2 | May 07     | Southampton General Hospital                                       |
| 3 | Jul-Sep 07 | Derriford Hospital, Royal Preston Hospital                         |
| 4 | Apr 08     | Hope Hospital, Addenbrookes Hospital                               |
| 5 | Jun-Aug 08 | Frenchay Hospital, Royal Free Hospital                             |
| 6 | Nov 08     | Queen's Hospital Romford, Royal London Hospital                    |

Figure 4: cumulative recruitment at all sites



## Conclusion

- DeNDRoN has been instrumental in supporting increasing numbers of sites to become research active in MND
- Bringing on new sites over time has helped sustain recruitment to the MND DNA Bank
- DeNDRoN has increased access to MND research to patients and clinicians