

## **House of Commons Science and Technology Select Committee Evidence Check**

This memorandum was collated by the Government Office for Science in response to the House of Commons IUSS Committee's 'Evidence Check'.

***Within the submission we highlight the contributions of individual departments, the Government Office for Science and the Government Chief Scientific Advisor have not offered any comment on contributions.***

## ***Brain Gym***

This response was provided by the Department for Children, Schools and Families.

### **Q1 What is the Government's policy on the use of Brain Gym and the teaching of its underlying theory in schools?**

The Department is aware of "Brain Gym", which is presented as learning readiness activities to help children of all physical, social and learning abilities to develop and practice sensory-motor skills for related learning skills.

The Department does not have a specific policy on the use of Brian Gym. We are unaware of any sufficiently robust or peer-reviewed evaluation of the approaches it promotes, which would allow any clear link between the use of Brain Gym and pupils' learning to be established. We are also aware of a significant body of criticism of the theoretical underpinnings of the programme, set out below.

Overall, Brain Gym has not been evaluated using a robust and appropriate methodology, therefore no conclusions about its effectiveness can be drawn using the existing sources of information.

### **Q2 What scientific evidence is there that Brain Gym works? Does the Government support the scientific theory behind Brain Gym?**

Brain Gym has been criticised as being unscientific in a wide-ranging and authoritative review of research into neuroscience and education.

Peer reviewed scientific studies into Brain Gym have found no significant improvement in general academic skills. Brain Gym's claimed results have been put down to the placebo effect and the general benefits of breaks and exercise. Brain Gym's founder, Paul Dennison, has admitted that many of Brain Gym's claims are not based on good science, but on his "hunches".<sup>1</sup>

In 2008 *Sense About Science* published a briefing document in which thirteen British scientists responded to statements taken from the "Brain Gym guide (Teacher's Edition)". Each of them entirely rejected the statements that were put to them. Brain Gym's scientific content was described as "pseudo-scientific". One of the scientists, Professor of neuroscience Colin Blakemore, said that "there have been a few peer reviewed scientific studies into the methods of Brain Gym, but none of them found a significant improvement in general academic skills. Sense about Science, along with

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<sup>1</sup> "News in brief". The Times. 2008-04-05. <http://www.timesonline.co.uk/tol/news/uk/article3671213.ece>. Retrieved 2008-09-01. "Paul Dennison, a Californian educator who created the programme, admitted that many claims in his teacher's guide were based on his 'hunches' and were not proper science."

the British Neuroscience Association and the Physiological Society, wrote to every Local Education Authority in Britain to warn them about the program.<sup>2</sup>

In 2007 Dr. Keith Hyatt of *Western Washington University*<sup>3</sup> wrote a paper in which he analysed the available research into Brain Gym, as well as its theoretical basis. He concluded that Brain Gym is not supported by research, and that its theoretical basis does not stand up. The paper also encouraged teachers to learn how to read and understand research, to avoid teaching material that has no rational basis.

## Background notes

Brain Gym is a commercial training program created in the 1970's by Dr. Paul Dennison and Gail E. Dennison, who "were seeking more effective ways to help children and adults of all physical, social and learning abilities, in particular those identified through the programme as 'learning disabled.'<sup>4</sup>

The program is based on the premise that all learning begins with movement, and that any learning challenges can be overcome by finding the right movements, to subsequently create new pathways in the brain. It claims that the repetition of certain movements "activates the brain for optimal storage and retrieval of information" and "promotes efficient communication among the many nerve cells and functional centres located throughout the brain and sensory motor system. There are 26 of these exercises, which are designed to "integrate body and mind" in order to improve "concentration, memory, reading, writing, organising, listening, physical coordination, and more.

Educational Kinesiology teaches that brain function is defined in terms of three dimensions: laterality is the ability to co-ordinate the left and right sides of the brain, focus is the ability to co-ordinate the front and back of the brain, and centering is the ability to co-ordinate the top and bottom of the brain. According to Brain Gym, people whose brains are not interconnected properly in the three different dimensions suffer from corresponding deficits; for example, the ability to move and think at the same time is dependent on laterality (left to right co-ordination). The Brain Gym exercises are claimed to work by interconnecting the brain in these three dimensions. Anatomical, physiological and neurological research does not support this model.

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<sup>2</sup> Sense About Science - Brain Gym". Sense About Science.

<http://www.senseaboutscience.org.uk/index.php/site/project/233/>. Retrieved 2008-04-11. "These exercises are being taught with pseudoscientific explanations that undermine science teaching and mislead children about how their bodies work. ... There have been a few peer reviewed scientific studies into the methods of Brain Gym, but none of them found a significant improvement in general academic skills."

<sup>3</sup> Hyatt, Keith J. (April 2007). "Brain Gym - Building Stronger Brains or Wishful Thinking?" (fee required).

Remedial and Special Education (SAGE Publications) 28 (2): 117–124. ISSN 0741-9325.

<http://rse.sagepub.com/cgi/content/abstract/28/2/117>. Retrieved 2008-09-12. "a review of the theoretical foundations of Brain Gym and the associated peer-reviewed research studies failed to support the contentions of the promoters of Brain Gym. Educators are encouraged to become informed consumers of research and to avoid implementing programming for which there is neither a credible theoretical nor a sound research basis."

<sup>4</sup> Brain Gym - about". The Official Brain Gym Web Site. <http://www.braingym.org/about>.

## ***Teaching English as an additional language***

This response was provided by the Department for Children, Schools and Families.

### **Q1 (a) How does the Government identify school children who do not speak English as a first language and/or who need additional training in English?**

#### **Identification**

From 2007 the School Census included a new Pupil First Language question. This allows schools to record each pupil's first language, rather than simply recording whether or not that language is English.

Pupils who do not speak English as a first language are identified through this census and a pupil's first language is defined as any language other than English that a child was exposed to during early development and continues to be exposed to in the home or community.

If a child was exposed to more than one language (which may include English) during early development, a language other than English should be recorded, irrespective of the child's proficiency in English.

#### **Process**

Pupil First Language data is collected from either parents or pupils as part of the school's admissions process and is usually obtained after parents have received confirmation of their child's place at the school. This information is also collected for new pupils arriving during the academic year.

Local Authority Data, Statistics, IT and Ethnic Minority Achievement (EMA) teams within Local Authorities are involved in the data collection process. They work closely in planning and implementing the data collection.

School administrative staff will input the information once this has been collected, but the collection process needs to be led by the school's Senior Management Team (SMT) and supported by specialist EMA staff, who should assist administrative staff in making decisions about how to record replies which cannot be mapped easily to the language code set.

DCSF statisticians use the School Census as a source for the Language variable which aggregates the pupils' language into the following 7 main groups:

- English
- Not known but believed to be English
- Other than English
- Not known but believed to be other than English
- Refused
- Information not obtained

- Invalid code

## **Q1 (b) How are children whose first language is not English taught English?**

National Strategies, a DCSF delivery partner have developed guidance with detailed strategies to help teachers support EAL pupils in the acquisition of English. They have focused on creating an inclusive learning culture by developing an inclusive curriculum to support learning and teaching. Pupils with EAL are generally taught in the mainstream class using scaffolding learning strategies and other methods that involve keeping cognitive challenges high. The following National Strategies publications provide guidance and advice on teaching pupils with EAL.

*Excellence and Enjoyment: Learning and teaching for bilingual children in the primary years.* <http://nationalstrategies.standards.dcsf.gov.uk/node/85322>

*Rationale for planning for children learning English as an additional language* <http://nationalstrategies.standards.dcsf.gov.uk/node/47481>

## **Q2 What evidence is used to support the method of identifying and teaching those children who require additional language support?**

### **Method of identification**

The Race Relations (Amendment) Act 2000 places a duty on schools to 'monitor and assess how their policies affect ethnic minority pupils, staff and parents'. Monitoring by ethnicity and language allows schools and Local Authorities (LAs) to compare the performance of different ethnic groups and assess the needs of those who seem to be underachieving.

The collection of first language data can make a major contribution to the planning and implementation of strategies which promote equality, value diversity and support the educational inclusion of all pupils. Good quality language data is also of particular importance where provision for pupils who speak more than one language is involved.

Language data also supports the analysis of pupil attainment at school, local and national level, and assists LAs and schools in their use of ethnic background data, providing valuable complementary information and a means of validating ethnicity data

Children learning EAL are among the highest and the lowest achieving groups nationally and because of this it is important that schools look at the achievement of children from different ethnic groups who are learning EAL.

Proper analysis and understanding of data will make it possible to gain a better insight into the many and complex issues that may contribute to variations in attainment by different groups of learners.

## **EAL Pedagogy / Method of teaching**

Research shows that language support is best provided within the curriculum wherever possible, as time out of subject lessons for additional language tuition is ultimately likely to cause the learner to fall further behind in the curriculum.

Research over the past two decades into the development of young bilingual learners has resulted in the development of a number of theories and principles that underpin the distinctive pedagogy for children who are learning EAL – children for whom the additional language being learned is also the medium of education. The development of EAL pedagogy has been influenced by social constructivist theories which emphasise the importance of scaffolding learning, and those which highlight the importance of socio-cultural and emotional factors. Children learning EAL will be affected by attitudes towards them, their culture, language, religion and ethnicity.

There has been a great deal of research over the past two decades into the development of young bilinguals – international, national and local including classroom-based action research. This has resulted in the development of important theories, principles and knowledge that have underpinned the development of these materials. The practical ideas, supporting materials and approaches included have been developed and trialled with the support of Local Authorities (LAs) and a large number of schools as part of the Primary National Strategy during 2004-06.

## **Evidence**

Research undertaken has looked at:

- How well children from ethnic minority backgrounds are actually doing in our schools
- The characteristics of effective schools
- The language and literacy skills and academic achievement of bilingual learners

The following extract from an OfSTED publication HMI 250 2001 *Inspecting English as an additional language 5-16* states on page 17 that 'Inspection evidence demonstrates that the most effective work is closely linked to the National Curriculum and that withdrawal from the mainstream should be limited with outcomes carefully monitored. In particular, de-contextualised language activities are rarely productive.'

The QCA (now known as QCDA) booklet – *A language in Common: Assessing English as an additional language* is a guide for Teachers and headteachers of pupils and students with English as an additional language, LEA support services, and English teachers. It has been developed to support the assessment of pupils of all ages for whom English is an additional language. The guide is intended to help teachers ensure that all their pupils develop as competent and confident speakers and writers of English.

The studies of academics, including those below, have been taken into account when developing the English education system of approach to supporting pupils with EAL.

## References

Bruner, J.S. (1975) 'Language as an instrument of thought', in Davies, A. (ed.) *Problems of Language and Learning*, Heinemann

Cummins, J. (1986) 'Language proficiency and academic achievement', in Cummins, J. and Swain, M., *Bilingualism in Education*, Longman

Cummins, J. (2000) *Language power and pedagogy: bilingual children in the crossfire*, in Bilingual education and bilingualism series, Multilingual Matters

Vygotsky, L. S. (1962) *Thought and Language*, MIT Press

## ***Street lighting, CCTV and crime***

This response was provided by the Home Office.

### **Street lighting and crime**

#### **Q1 What is the Government's policy on the use of street lighting to reduce crime?**

There is a well established body of evidence to show that the design and layout of places has a significant impact reducing crime and fear of crime. Home Office guidance recommends that designing out crime and designing in community safety should be central to the planning and good design of the built environment and that as part of good design the role lighting can play in reducing crime should be considered.

Further, Home Office guidance also reflects that in any crime reduction programme, street lighting should be considered in co-ordination with other intervention strategies not least because of the role it plays in increasing community pride and informal social control.

The companion guide to Planning Policy Statement 1 'Safer Places, The Planning System and Crime Prevention' (ODPM/Home Office 2004) for example highlights that well-designed public lighting increases the opportunity for surveillance at night and sends out positive messages about the management of an area but that it needs to be sensitive to the needs of residents and users and should provide security without resulting in glare and compromising privacy.

#### **Q2 On what evidence is the Government basing this policy?**

A systematic review of existing international evidence on the effectiveness of improved street lighting on crime was published in 2008 (review for the Campbell Collaboration, by David Farrington & Brandon Welsh). The review concluded that improved street lighting significantly reduces crime, adding that improved street lighting should be considered as a potential strategy in any crime reduction program in coordination with other intervention strategies, and that depending on the analysis of the crime problem, improved street lighting could often be implemented as a feasible, inexpensive, and effective method of reducing crime.

An earlier (2002) review for the Home Office by the same authors had come to the same conclusions

## References:

Farrington, D. and Welsh, B. (2008): Effects of improved street lighting on crime. Campbell Systematic Reviews: The Campbell Collaboration

[http://db.c2admin.org/doc-pdf/Welsh\\_StreetLight\\_review.pdf](http://db.c2admin.org/doc-pdf/Welsh_StreetLight_review.pdf)

Atkins, S. Husain, S and Storey, A (1991) The influence of street lighting on crime and fear of crime. Crime Prevention Unit Paper Number 28. London: Home Office.

<http://www.homeoffice.gov.uk/rds/prgpdfs/fcpu28.pdf>

Ramsay, M. and Newton, R (1991). The Effect of better street lighting on crime and fear : a review. Crime Prevention Unit Paper Number 29. London: Home Office

<http://www.homeoffice.gov.uk/rds/prgpdfs/fcpu29.pdf>

Farrington, D. and Welsh, C. (2002) Effects of improved street lighting on crime: a systematic review. Home Office Research Study 251. London: Home Office. (addendum added 14.10 03)

<http://www.homeoffice.gov.uk/rds/pdfs2/hors251.pdf>

Government advice on the planning system and crime prevention including general guidance on the importance of surveillance (overlooking) is set out in the ODPM/Home Office guide: Safer Places the Planning System and Crime Prevention (in particular pp 28-29).

<http://www.communities.gov.uk/publications/planningandbuilding/saferplaces>

'Safer Places' flags that further more detailed advice is available from the police initiative Secured By Design. Details are available from the website:

<http://www.Securedbydesign.com>

## **CCTV and crime**

### **Q1 What is the Government's policy on the use of CCTV to combat crime?**

The origins of CCTV provision for public space in this country lie in the early 1980s. Since then (and mostly by local authorities) the use of public space community safety CCTV has expanded gradually but significantly and it now plays a key role in crime and anti-social behaviour reduction, public protection, missing person inquiries and serious crime, including terrorism investigations. CCTV has been installed for different reasons in different ways.

CCTV does work and works best when it is used alongside a wider strategy of partnership working between the police, local authorities and local communities to tackle crime in their neighbourhood

Seeking to make sure that the benefits of CCTV are applied effectively to prevent crime and to deal with those who choose to commit crime, the Government's focus is on better training, improved partnership working and more co-ordinated use of technology.

Recognising the need to strengthen the evidence base and provide strong and compelling narrative on the how well CCTV is working:

- the National Policing Improvement Agency and Cheshire Constabulary by the end of the year (2009) aim to have completed a qualitative analysis of recorded crime data and case files in Cheshire to determine the value of CCTV to investigations.
- by next Spring, establish a library of case studies around the use of CCTV in crime detection with particular focus on major crime, including CT and public-space violence; and, in the same time frame,
- develop the criteria for assessing the quantitative and qualitative costs and benefits of CCTV. This will enable Government, the police, local authorities and the private sector to assess existing and future investment in CCTV and the contribution that it makes and can make to crime detection, crime reduction and public confidence.

## **Q2 On what evidence is the Government basing this policy?**

The most recent and most robust assessment of the international evidence on the impact of CCTV was a 2008 systematic review by academics Brandon Welsh and David Farrington, published by the Campbell Crime and Justice Group. The review was part funded by the Home Office. The review found that CCTV has a modest but statistically significant crime reduction effect; is most effective in reducing crime in car parks; is most effective when targeted at vehicle crimes (largely a function of the successful car park schemes); and is more effective in reducing crime in the UK than in other countries. The review concluded that while the results lend support for the continued use of CCTV to prevent crime in public space, they suggest that it be more narrowly targeted than its present use would indicate.

Other research has shown that CCTV can increase public confidence and there are some high profile case study examples of how CCTV has played an important role in detecting crime and protecting the public: for example, in recent terrorist investigations (including 7/7 and 21/7), and the conviction of Steve Wright for the Ipswich murders.

Research papers:

Campbell Crime and Justice Group

[http://db.c2admin.org/doc-pdf/Welsh CCTV review.pdf](http://db.c2admin.org/doc-pdf/Welsh_CCTV_review.pdf)

Home Office, Research, Development and Statistics Department: assessing the impact of CCTV, 2005

<http://www.homeoffice.gov.uk/rds/pdfs05/hors292.pdf>

Home Office, Research, Development and Statistics Department: The impact of CCTV: fourteen case studies, 2005

<http://www.homeoffice.gov.uk/rds/pdfs05/rdsolr1505.pdf>

Home Office, Research, Development and Statistics Department: Crime prevention effects of closed circuit television: a systematic review, 2002

<http://www.homeoffice.gov.uk/rds/pdfs2/hors252.pdf>

## ***Human provenance pilot project***

This response was provided by the Home Office.

### **Q1 What is the Government's initial analysis of the Human Provenance Pilot Project and plans for this scheme in the future?**

This joint UKBA/SOCA pilot project is aimed at tackling abuse of the asylum system, particularly nationality swapping. The pilot planned to run over three months involves a combination of forensic techniques such as isotopic analysis of hair and nails together and ancestral DNA and will be combined with language analysis and enhanced interviewing to examine whether this can indicate a persons possible origins and recent movements. All testing will be voluntary with the person required to give written consent. During the pilot the data will not be used to support live decision making but rather to examine the viability of the techniques.. At the conclusion of this pilot we will review the results, including the underpinning science and the ethical implications of the work. The Forensic Regulator will also be consulted during the period of the 3 month pilot. Only if the evaluation and regulatory review is positive, will UKBA proceed to use the results of future tests to support the decision making process in specific cases.

Another part of this project is aimed at combating child trafficking and child abuse by DNA testing family groups where there is a reasonable suspicion they are not biologically related as claimed. This is in line with new statutory duties to protect vulnerable children. These tests are not subject to the three month review and the results will be used by case owners and the social services.

The project planned to run to July 2010 depending on ongoing evaluation and future funding.

### **Q2 What evidence was used to formulate this programme?**

The pilot was based on some preliminary scientific papers in these areas (see attached bibliography) which suggested that a small proof of concept trial was an appropriate next step.

## **Bibliography**

### **Y-STR**

#### **SOMALIA**

Sanchez JJ, Hallenberg C, Børsting C, Hernandez A, Morling N (2005) High frequencies of Y chromosome lineages characterized by E3b1, DYS19-11, DYS392-12 in Somali males. *Eur. J. Hum. Genet.*, 13, 856–866.

Hallenberg C, Simonsen B, Sanchez J, Morling N (2005) Y-chromosome STR haplotypes in Somalis. *Forensic Sci. Int.*, 151, 317–321.

Jobling MA, Tyler-Smith C (2003) The human chromosome: An evolutionary marker comes of age. *Nat. Rev. Genet.*, 4(8),598-612.

Luis JR, Rowold DJ, Regueiro M, Caeiro B, Cinniöglu C, Roseman C, Underhill PA, Cavalli-Sforza LL, Herrera RJ (2004) The Levant versus the Horn of Africa: Evidence for Bidirectional Corridors of Human Migrations. *Am. J. Hum. Genet.*, 74, 532–544.

Cruciani F, La Fratta R, Torroni R, Underhill PA, Scozzari R (2006) Molecular dissection of the Y chromosome Haplogroup E-M78 (E3b1a): A posteriori evaluation of a microsatellite-network-based approach through six new biallelic markers. *Human Mutation*, 27(8), 831-832.

#### **MITOCHONDRIAL**

##### **AFRICA**

Salas A, Richards M, De la Fe T, Lareu MV, Sobrino B, Sánchez-Diz P, Macaulay V, Carracedo A (2002) The Making of the African mtDNA Landscape. *Am. J. Hum. Genet.*, 5, 1082-1111.

##### **KENYA**

Brandstätter A, Peterson CT, Irwin JA, Mpoke S, Koech DK, Parson W, Parsons TJ (2004) Mitochondrial DNA control region sequences from Nairobi (Kenya): inferring phylogenetic parameters for the establishment of a forensic database. *Int. J. Legal Med.*, 118, 294–306.

##### **SNP's**

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## ***Road safety: bicycle helmets***

This response was provided by the Department for Transport.

### **Q1 What is the Government's policy on recommending or requiring the use of bicycle helmets?**

The Department for Transport believes it is sensible for cyclists, and especially children, to protect themselves by wearing a cycle helmet. Our road safety publicity materials and the Highway Code recommend the use of a cycle helmet. We have no plans to make their use compulsory.

### **Q2 What evidence on bicycle helmets and safety has the Government considered in formulating its policy?**

A review commissioned by the Department ('Bicycle Helmets - A review of their effectiveness', Road Safety Research Report No 30, available at: <http://www.dft.gov.uk/pgr/roadsafety/research/rsrr/theme1/bicyclehelmetsreviewofeffect4726>) concluded that overall there is evidence that bicycle helmets can be effective at reducing the incidence and severity of head, brain and upper facial injuries and that they can be effective in reducing injury for users of all ages, though particularly for children. The report also concludes that there is some evidence that compulsory helmet wearing may discourage some people from cycling, leading to decreased bicycle use.

However, we believe it would be irresponsible not to promote a product that can reduce injuries and we continue to promote helmet wearing on a voluntary basis, especially by children.

The Department has commissioned a new research project on cyclists' road safety. This will include a new review of cycle helmet effectiveness. We are aiming to complete the review of cycle helmet effectiveness later this year with the publication of the project's final reports in Autumn 2010.

We measure cycle helmet wearing rates periodically, in 1994, 1996, 1999, 2002, 2004, 2006 and most recently 2008. The 2008 wearing rate survey shows that cycle helmet rates on major built up roads have gone up from 30.7% in 2006 to 34.3% and on minor roads have gone up from 13.8% in 2006 to 16.7% in 2008. The wearing rate for children on major built up roads was 17.6% in both 2006 and 2008, while for children on minor roads the rate rose from 9.4% in 2006 to 12.0% in 2008.

Whilst compulsion remains an option that we will review from time to time, at these levels making helmets compulsory would cause enforcement difficulties and without greater public acceptance could have an effect on levels of cycling.

## ***Speed Cameras***

This response was provided by the Department for Transport.

### **Q1 What is the Government's policy on use of speed cameras?**

The primary objective for speed camera deployment is to reduce deaths and injuries on roads by reducing the level and severity of speeding. The aim is to do this by preventing, detecting and enforcing speed offences, which includes encouraging changed driver behaviour by the use of safety camera activity.

Safety cameras are deployed and operated locally by road safety partnerships as part of their overall road safety remit. They have the freedom to spend the specific road safety grant on cameras or any other locally agreed road safety measure. The Department for Transport's guidance on the use of cameras recommends they are deployed only where there is a history of speed related accidents or where there is community concern about speeding. Cameras should be coloured yellow and co-located with speed limit signs where permitted and practicable with warning signs placed in advance, so that motorists are easily able to comply with the speed limit. However, the police may also carry out covert speed enforcement.

### **Q2 What evidence is there that the policy improves road safety?**

Evaluations around the world have shown repeatedly that speed cameras reduce vehicle speeds, accidents, deaths and serious injuries at camera sites. A literature review undertaken by the University of the West of England, published 11 February 2005, failed to find a single published research paper anywhere in the world that found cameras to have negative overall effects.

The independent four-year evaluation report of the National Safety Camera Programme was published on 15 December 2005. It found a 42% reduction in people killed or seriously injured at camera sites across the 38 partnership areas, that means around 1,745 fewer people killed or seriously injured per annum, including over 100 fewer deaths. In addition, there was a 22% reduction in personal injury collisions, which translates into a reduction of 4,230. These evaluations are of the benefits of the cameras over and above the long-term national trend of casualty reductions. However, a proportion of the reduction could be attributable to "regression-to-mean" (this arises because accidents in the period before the installation of a camera may be higher than the long-term average for that location). The report concludes that, even after allowing for this, safety cameras achieve substantial reductions in collisions and casualties.

Evidence suggests that in addition to motorists slowing down in the immediate vicinity of camera sites, they have also been slowing down in the wider area where speed cameras are located. The Department's annual Vehicle Speeds data shows that the proportion of cars exceeding the speed limit on 30mph roads has reduced from almost three quarters in 1996 to just under half in recent years.

## ***Wind turbine syndrome***

This response was provided from the Department for Environment, Food and Rural Affairs with input from the Department of Energy and Climate Change.

### **Q1 Does the Government have a stance on Wind Turbine Syndrome?**

Wind Turbine Syndrome is a name coined by one researcher in the United States who believes that those living close to wind farms can suffer from a variety of symptoms as a result of their proximity to wind farms. It is unclear whether there is widespread support from other professionals for these effects to be formally described as a syndrome. The cause of these effects seems to be the noise (and perceived vibration) that can be generated by wind turbine units. The Government has no formal stance on WTS, but will review its position as and when new evidence emerges.

### **Q2 What evidence does the Government consider when assessing the potential health risks of wind turbines to nearby residents?**

With regard to noise, the Government has been aware for many years of the potential noise impact from wind turbines. In the mid 90s, it prepared a report through the Energy Technology Support Unit (ETSU) of the former DTi that described how noise from wind farms should be assessed and what noise criteria should be applied. The current Planning Policy Statement (PPS) 22 on renewable energies also makes reference to this document as does the recently published consultation documents setting out the proposed new National Policy Statements for renewable sources. The ETSU report sets out the method by which the government expects developers and planning authorities to take account of the noise impacts and by implication the noise related health effects of wind farms. The Government has also commissioned research to understand further the impacts of noise from wind farms and how they should be assessed. The evidence arising from that research is being reviewed.

The Government is aware of the possibility of other health affects linked to wind turbines, in particular the risk of photo epilepsy arising from 'shadow flicker'. PPS22 states how to assess and address shadow flicker advising that if the wind turbines are located in accordance with guidance in PPS22 then the risk of shadow flicker should be avoided.