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Dear Head Teachers, Governors and Local Authorities,

Below you will find responses from **SSITA** to the statements made by Public Health England (PHE), about the safety of Wi-Fi technology for use in schools. As employers, you are responsible for providing a safe school environment; the responses below can be considered alongside the advice given to you by PHE. We also realise that all schools have a legal duty to safeguard children by preventing any impairment to their health and development. We believe that the information below will usefully assist you when fulfilling these legal requirements.

SSITA Comments on the five Key points from PHE: (these are in red underlined text below)

- There is no consistent evidence to date that exposure to radiofrequency (RF) signals from Wi-Fi and WLANs adversely affect the health of the general population.

For science to find evidence “consistent”, or not, the studies being compared need to be investigating exactly the same conditions, species/strain/sex, prior exposures and methodologies. The statement above is misleading because it implies that the reader can dismiss concerns of harm because identical studies have failed to give the same results. In reality, many studies have found damage or adverse effects in humans/human cells or other animals from Wi-Fi/2.4GHz wireless signals. Thirteen studies listed in the link here: <http://wifiinschools.org.uk/30.html> have found increased oxidative stress in animal or human cells from Wi-Fi/2.4GHz signals. Increased oxidative stress is known to lead to damage of proteins, lipid membranes and nucleic acids and increases the risk of cancer. Eight studies in the link above found adverse effects of Wi-Fi/2.4GHz on fertility or reproductive success. These studies and others, backed up by many more carried out on mobile phones and other RF signals, are enough to raise serious concerns about the safety of Wi-Fi for use in schools. The two Bio-Initiative Reports also give a great deal of useful evidence (<http://www.bioinitiative.org/>). The World Health Organisation’s International Agency for Research on Cancer (IARC) classified RF radiation as a Group 2B “possible human carcinogen” in 2011.

However, even if a scientifically accurate definition of the word “consistent” is used, **SSITA** believes that we neither need nor should wait for totally “consistent” evidence. We are never likely to get such “consistent” evidence as people, the technologies and our use of them are so varied.

Complete consistency is not required for action to be taken:

European Commission Communication on the Precautionary Principle 2nd February 2000
http://ec.europa.eu/dgs/health_consumer/library/pub/pub07_en.pdf

SSITA believes that lack of precautionary action will lead to long-term harm to the physical and mental wellbeing of the children exposed on a daily basis to Wi-Fi, Tablet computers and the like.

- The signals from Wi-Fi are very low power, typically 0.1 watt (100 milliwatts), in both the computer and the mast (or router) and resulting exposures should be well within internationally-accepted guidelines.

The signals are within ICNIRP Guidelines – but **SSITA** and many others dispute the relevance of guidance primarily based on heating effects (Specific Absorption Rate or SAR) over 6 minutes when there are many good, peer-reviewed, scientific studies showing evidence of harm, *thousands of times lower* than the ICNIRP Guidance values.

Moreover, it does not matter if the signals are low power, if they are enough to cause biological damage and adverse effects, as they have been found to do (<http://wifiinschools.org.uk/30.html>).

- The frequencies used are broadly the same as those from other RF applications.

This is true, but most humans were not generally exposed to significant levels of signals at these frequencies before the last 30 years. Levels in this part of the RF spectrum have increase by at least 1,000,000,000,000,000-fold in the last 100 years and by about 1,000,000-fold in the last 30 years alone. Many studies have been carried out on insects, birds, other animals and plants that are showing adverse effects. These are not psychosomatic.

- Based on current knowledge, RF exposures from Wi-Fi are likely to be lower than those from mobile phones.

This is a ridiculously ignorant statement by PHE who have not even formally assessed and published exposure from iPads and other wireless tablet computers. For their assessment of exposures Peyman, *et al*, only measured laptop PCs and Wi-Fi/wLAN Access Points – and showed that the typical levels in the classroom were significantly higher than those found 100 metres away from a mobile phone mast while standing in the main beam. They measured the levels at 0.5 and 1 metre away from the laptop PCs. **Most children use a laptop closer than 0.5 metres (about 0.3 m or 30 cm is more common).** Tablets are often held in the hand (or on a lap) with the hands actually touching the device close to its internal antennas. Even when on a table the child is usually very close to the screen – more like 20 cm. **As power increases approximately with the square of the distance to the source, this would represent an approximate 4-fold increase in the levels measured by Peyman, et al, at 50 cm from laptop PCs.**

Although **SSITA** believes that SAR is not the best metric (signal strength in volts per metre is better for pulsing signals like Wi-Fi), **let us examine the published SAR values of mobile phones and iPads:**

Taking all 432 mobile phones listed on www.sarvalues.com we find a range of maximum SAR values of 0.12 to 1.59 W/kg, with an average of 0.8 W/kg (in 10 g of tissue). Taking 11 modern smart phones on www.sardatabase.com we get a range (in 10g of tissue) of 0.35 to 0.8 W/kg, with an **average maximum SAR of 0.42 W/kg**. The Apple/FCC official **SAR for an iPad3 on Wi-Fi is 0.39-0.51 W/kg** in 10 g of tissue. So, the max Wi-Fi SARs from iPads are very similar to those from modern mobile phones.

The UK Chief Medical Officers and Department of Health currently advise children and young people under the age of 16 to use mobile phones for essential purposes only. The SAR values above suggest that this advice should also apply to wireless tablet computers.

But that is only a small part of the issue. All modern phones employ Adaptive Power Control (APC).

This lowers their power when they have a good connection to a base station. GSM handsets have a 1000:1 range of control and typically operate between 10 and 100 times lower than their maximum. Modern 3G/UMTS handsets have a 50,000,000:1 range of power control and typically work at around one-thousandth of their maximum power. So their average SAR exposure is a tiny fraction of their maximum SAR value.

HOWEVER, iPads, other tablets and most laptops do not have any implementation of APC on Wi-Fi – so they work at their full power all the time when on Wi-Fi. There are gaps between data bursts, especially when not downloading lots of data, but the microwave data-bursts are always at full power. There is a proximity sensor on the back of iPads that Apple claims senses when it is used on a lap and decreases the transmit power to avoid breaking the SAR regulations. However, this does not work when the iPad is used on a table and a child's face is close to the screen.

- [On the basis of current scientific information, exposures from Wi-Fi equipment satisfy international guidelines. There is no consistent evidence of health effects from RF exposures below guideline levels and no reason why schools and others should not use Wi-Fi equipment.](#)

SSITA strongly refutes the views expressed in this statement.

There are good reasons why schools should not use Wi-Fi equipment. Schools should not use Wi-Fi because they have a legal duty to safeguard children by preventing the impairment of children's health and development. Scientific studies have found that Wi-Fi/2.4GHz wireless signals can increase oxidative stress (which damages cells), damage DNA (which may lead to mutations, cell death or cancers), increase the proliferation of human leukaemia cells, alter human brain activity (and thus likely to affect brain development) and damage male and female fertility.

An obvious response to the evidence of damage from RF signals published in the scientific literature, would be to investigate further with biological tests the extent to which Wi-Fi signals are causing biological damage and under what conditions these effects occur. Even though PHE advise schools throughout the UK with confidence that there is no reason why Wi-Fi should not be used in schools, they have yet to publish any of their own biological or health studies into the possible effects of Wi-Fi. We also note that the Government funding of the Peyman *et al* study specifically excluded any investigations into possible adverse health effects. Surely schools should be questioning why PHE have carried out no biological or health studies into the effects of Wi-Fi since they announced in 2007 that they would be thoroughly investigating the safety of Wi-Fi for use in schools. All the investigation did was to measure signal levels and to state that these were below ICNIRP Guidance values.

SSITA believes that Information Technology is important in modern schooling. For most applications **SSITA** supports the use of fixed desktop, hardwired PC computers with a good quality ergonomic keyboard and mouse, with a flat-screen display and a hard-wired (Ethernet or fibre optic) network connection. These are 'Earthed' and do not use wireless and expose the user to minimal (but not non-existent) electromagnetic fields (EMF). There is a place for occasional use of non-wireless laptops but the EMF exposures (from touchpad, etc) are higher and the keyboard is much less ergonomic and more likely to lead to repetitive strain injury (RSI) problems in later years (small light finger and wrist movements). Tablets and Smart Phones should not be used as both result in much higher EMF and RF exposure to the children. **SSITA** believes that this approach would be both proportionate and protective at very little difference in cost.

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