

Wi-Fi® and Health



Wi-Fi is at the center of today's connected experience. Already a network of choice in an estimated 201 million households¹ and countless enterprises and schools worldwide, Wi-Fi continues to expand as the technology of choice for traditional home, government and business networks, as well as in industries such as smart energy, transportation and healthcare. Nearly a billion Wi-Fi devices have shipped to date² and the technology is increasingly a part of people's everyday lives, allowing users to connect with each other where they want, when they want.

Due to the ubiquity of Wi-Fi technology, questions about the safety of radio waves and Wi-Fi devices tend to arise from time to time. The wireless industry takes these concerns very seriously. This brochure is designed to answer questions about the health and safety aspects of Wi-Fi and to share the opinions of respected, public health institutions on this topic.





What is Wi-Fi?

Wi-Fi is a flexible, short-range data communications technology used to connect devices as diverse as notebooks, tablets, handsets, consumer electronics, smart utility meters and much more. Wi-Fi technology is widely used to provide wireless internet access in public places like airports, hotels and shopping centers, and is also used in the home and office to allow a wide range of devices to access the internet and network with each other without the need for special cables. Wi-Fi devices use low-power radio waves in the 2.4 and 5 GHz range to transmit and receive data over the air.



What does the research about Wi-Fi safety say?

Radio waves provide the benefits and enjoyment of television, radio and the increasing array of mobile communications services. Wi-Fi uses the same radio waves that are a common part of our everyday lives.

The safe use of radio waves has been extensively studied for more than 60 years. This large body of scientific research is regularly reviewed by numerous independent, scientific expert panels, government agencies, standard-setting organizations and health authorities from around the world. These organizations have reached the same general scientific conclusion—to date there is no established evidence of adverse health effects from exposure to radio waves at or below the recommended limits.

In recent years, several studies have specifically focused on measuring radio frequency (RF) exposure levels used by Wi-Fi networks. Scientists and governments conducted on-site studies which measured Wi-Fi networks in places where they are commonly used such as schools, home and offices. For example, the United Kingdom's Health Protection Agency completed research to assess exposure to children from wireless computer networking equipment used in schools. Findings from the research showed that exposures from Wi-Fi devices are small in relation to international exposure standards. This result is consistent with other studies about Wi-Fi that show, without exception, the intensities of radio waves used by Wi-Fi are substantially below the international exposure limits.



Is Wi-Fi safe to use in schools and around children?

The health, safety and protection of children are of paramount importance. Wi-Fi devices and other wireless products are subject to international exposure standards endorsed by the World Health Organization (WHO) and other health agencies from around the world. The standards are science-based, developed to protect the public and include a substantial margin of safety built into the limits. The WHO affirms that the safety margin takes into account all members of the population, including the elderly, ill, pregnant and children. In response to questions raised in Canada about using Wi-Fi in schools, Health Canada stated that Wi-Fi exposure levels are typically well below Canadian and international exposure limits and there is no convincing evidence that they are a health hazard.³ Health Canada's conclusions are consistent with the findings of other international bodies and regulators including the World Health Organization, the International Commission on Non-Ionizing Radiation Protection, the Institute of Electrical and Electronics Engineers and the U.K. Health Protection Agency.

Who develops the limits for exposure to radio waves?

Wi-Fi is subject to the same safety requirements applied to all radio products. The standards establish exposure limits based on scientific studies which include substantial margins of safety to protect both users and the general public. The exposure limits, are developed by independent scientific organizations, such as the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and the International Committee on Electromagnetic Safety of the Institute of Electrical and Electronics Engineers (IEEE).

Are Wi-Fi devices in compliance with RF exposure requirements?

All Wi-Fi products are required to be evaluated to ensure they conform to the RF exposure limits adopted by agencies around the world. These evaluations are done in accordance with the various regulations and guidelines adopted or recommended by regulatory agencies around the world, such as the Federal Communications Commission⁴ in the United States.

What is the wireless industry doing to ensure the continued safety of Wi-Fi products?

The Wi-Fi Alliance[®] supported an independent exposure study which conducted 356 measurements at 55 sites (including schools and hospitals) in four countries around the world. The study published in Health Physics, a peer-reviewed scientific journal, concluded in all cases, the measured Wi-Fi signal levels were very far below international exposure limits (IEEE C95.1-1991 and ICNIRP) and in nearly all cases, far below other RF signals in the same environments.⁵ The Wi-Fi Alliance continually monitors information regarding RF health to stay informed of up-to-date research and to make sure its members and the public are kept informed of the latest relevant information.

At the same time, the Mobile Manufacturers Forum and the GSM Association (GSMA) are also supporting a wide variety of international research into RF safety, with many of the research projects involving national and international health agencies.



What is the MMF?

The Mobile Manufacturers Forum (MMF) is an international association of telecommunications equipment manufacturers. The MMF was established specifically to support ongoing international research into the safety of wireless technology in conjunction with national and international health agencies around the world.

What is the GSMA?

The GSMA represents the interests of mobile operators worldwide. Spanning 219 countries, the GSMA unites nearly 800 of the world's mobile operators, as well as more than 200 companies in the broader mobile ecosystem, including handset makers, software companies, equipment providers, Internet companies, and media and entertainment organisations. The GSMA also produces industry-leading events such as the Mobile World Congress and Mobile Asia Congress.

What is the Wi-Fi Alliance?

The Wi-Fi Alliance is a global non-profit industry association of hundreds of leading companies devoted to the proliferation of Wi-Fi technology across devices and market segments. With technology development, market building, and regulatory programs, the Wi-Fi Alliance has enabled widespread adoption of Wi-Fi worldwide. The Wi-Fi CERTIFIED™ program was launched in March 2000. It provides a widely-recognized designation of interoperability and quality and it helps to ensure that Wi-Fi enabled products deliver the best user experience. The Wi-Fi Alliance has completed more than 10,000 product certifications to date, encouraging the expanded use of Wi-Fi products and services in new and established markets.

Where can I obtain more information on this topic?

To find out more information, visit any of the following websites:

- Australian Communications and Media Authority, www.acma.gov.au
- Australian Mobile Telecommunications Association (AMTA), www.emfexplained.info
- GSM Association, www.gsmworld.com/health
- ICNIRP, www.icnirp.org
- Mobile Manufacturers Forum, www.mmfa.org
- U.K. Health Protection Agency, www.hpa.org.uk/
- US Federal Communications Commission, www.fcc.gov/oet/rfsafety/rf-faqs.html
- Wi-Fi Alliance, www.wi-fi.org/wlan_health.php
- World Health Organization, www.who.int/peh-emf/



¹ Parks Associates, "Networks in the Home: Global Growth; A Report for the Wi-Fi Alliance."

² ABI Research, December 2010.

³Health Canada, Safety of Wi-Fi Equipment, <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/wifi-eng.php> (December 2010).

⁴Federal Communications Commission, Office of Engineering and Technology Bulletin 65 Supplement C, Revision 01-01: "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields."

⁵Foster KR, "Radiofrequency Exposure from Wireless LANs," Health Physics 92:280-289 (2007).