

FUNGAL INFECTION TRUST

TRUSTEES' REPORT

OBJECTIVES AND ACTIVITIES

1. To promote research in all aspects of mycology, mycotic diseases, fungal toxicology and microbial disease (of all living things) and to publish the useful results thereof.
2. To advance education particularly among physicians and scientists about mycology, mycotic diseases, fungal toxicology and microbial diseases in general.
3. To generally support basic research into fungi and fungal disease, train scientists into mycology and related disciplines.
4. To provide information to patients suffering from fungal diseases, in particular aspergillosis.
5. To raise awareness of fungal pathogens and fungal diseases amongst the general public in the UK and internationally.

Review of Activities

In 2017/18, most of the FIT's activity was devoted to health professional education, public outreach and research. The FIT website (www.fungainfectiontrust.org) averaged 4,500 to 9,500 unique visitors per month in 2016-17.

Online education in fungal microscopy and histology (www.microfungi.net/)

The FIT has extended the world's first online Microscopy and Histology course (www.microfungi.net/), of with Module 4 (histopathology of rare fungi) and translated Modules 1-3 into French, Spanish and Portuguese. Module 4 was launched in March 2018. In early April 2018, there are 757 registered users on Microfungi.net. Users can refer to the course materials indefinitely, even if they have completed all the modules and received their certificates. An additional 122 registrations occurred in March 2018, following the release of Module 4.

The Aspergillus Website (www.aspergillus.org.uk)

The Aspergillus Website remains the world's most comprehensive resource for the pathogenic and allergenic fungi Aspergillus and the diseases that they cause. It is completely free to all users. It is supported from the UK National Health Service and unrestricted educational grants from various corporate donors, notably Mayne Pharma, Merck, Pfizer, Dynamiker, Gilead, Basilea and Zambon.

The Aspergillus Website provides simple, free access to >71,000 pages all indexed in Google, ready to be searched, over 12,000 scientific articles (including a unique collection of 829 historical articles) and ~15,200 conference abstracts from 1974 onwards. The comprehensive list of drugs and drug interactions with antifungals is continually updated, and now includes the drug interaction database (including the antifungal drug interaction app for apple and android phones) is now popular and well used. The drug interaction database has been recently updated to accommodate all listed prescription drugs. This database is also available as an 'App' via iPhone and Android smartphones to allow ease of access and use, both are updated regularly. Over 2,300 potentially harmful interactions are listed. Over 2,390 (Android) and 501 (iOS) APPs have been downloaded. Externally there are over 20,000 active links to www.aspergillus.org.uk and www.nacpatients.org.uk.

The Aspergillus Website is listed at number 1, 1, 2 and 3 in Google.co.uk, number 1, 1, 2 and 3 in Google.com, number 1, 1, 4, 3 in Bing and Yahoo! for 'aspergillus', 'ABPA' 'aspergillosis' and 'aspergilloma' respectively. If 'aspergillus' is searched in Google, there are 7 million results.

Current monthly figures show that 100,000 - 130,000 individual computers accessed **The Aspergillus Website** and **Patients' website** alone per month, 5,000 to 8,000 people daily. This equates to 10.2 million 'requests for content'. About 46% of visits are using smaller devices. There has been a continuing increase in usage, with total requests rising from 4.39 million in September 2016 to 9.57 million in January 2018.

Mapping of www.aspergillus.org.uk (see figure below for 2018 figures, darker shading = more users) shows that The Website reaches people in over 147 countries. UK is the country from which we get most visits with USA and Russia in the next 2 places, China and France in 4th & 5th place respectively.

FUNGAL INFECTION TRUST

TRUSTEES' REPORT



Top Threat Origins Last month		Top Traffic Origins Last month		Top Crawlers / Bots Last month	
Country	Requests	Country	Traffic	Crawler/Bot	Pages Crawled
United States	18428	United Kingdom	3558003	Bing	196801
United Kingdom	4834	United States	2723391	Google	186908
India	3133	Russian Federation	439905	Baidu	49110
Canada	1753	China	306385	Yandex	47645
Philippines	1335	France	271927	Twitter	480

Over 54% of users access the Aspergillus Website using iPhone or iPad, 10% use an Android phone and only 36% use a laptop or personal computer. Twitter posts are put out almost every day (@AspergillusWeb – 1,350 followers), Blogs twice a week, and monthly newsletters from the Aspergillus Website are sent out to over 27,000 (free) subscribers. This figure is driven by newly registered members seeking to access our secure ‘articles’.

Patients' website (www.nacpatients.org.uk)

The Website for Patients provides a great deal of information for patients on disease, diagnostic and therapies as well as multiple ‘Frequently Asked Questions’ sections.

The www.nacpatients.org.uk website averages 11,000 visitors per month with many new visitors. The top countries utilising the Patients' Website by origin are: 1. USA, 2. UK, 3. Germany, 4. Ukraine, 5. Australia, 6. Russia. There are >22,000 active links to this website.

Many patients and carers use online support discussion groups and the FIT supports these people in several ways:

- Our (Facebook & Yahoo!) worldwide communities are very active with >3,000 participants (<https://www.facebook.com/Aspergillus.and.Aspergillosis>),
- The NHS Choices online community for Aspergillosis has 1,488 participants
- Local online Facebook groups (18 groups, 9 in the UK serving 313 people)
- Facebook group specifically for carers (116 members) (<https://www.facebook.com/groups/aspergillussupport/>)
- The Professional LinkedIn members (Aspergillus and Aspergillosis Group) has over 520 members.

FUNGAL INFECTION TRUST

TRUSTEES' REPORT

The provision of live and recorded online events held by the National Aspergillosis Centre, happening on a monthly basis (250-450 viewings per month in 2018) provide several means of support including factual and social issues has provided a focus for patients and their carers.

Leading International Fungal Education (LIFE) (www.LIFE-Worldwide.org)

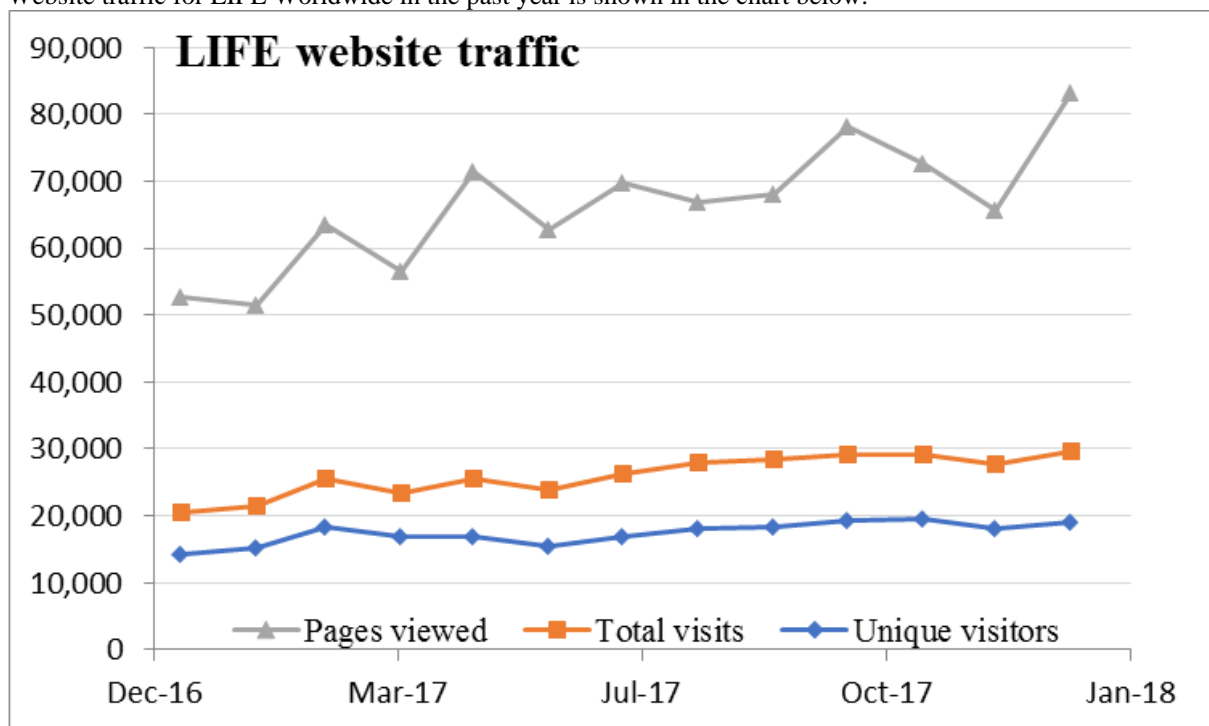
The FIT continues to support the expansion of the educational brand LIFE, a summary website with key information of fungi causing disease, the most important fungal diseases, diagnostic tests, including skin allergy tests and imaging, and antifungal therapies, in English and Spanish.

It presents information in two main formats:

- Bite-sized summaries, to be used as an introductory overview or quick reference
- Recorded lectures of a quality commensurate with a MSc course

Static content is available in both English and Spanish, and includes focused summaries of the main diseases, treatments, diagnostics and causative agents, as well as continuously-updated listings of treatment guidelines and commercial diagnostics (including direct links to suppliers).

Website traffic for LIFE Worldwide in the past year is shown in the chart below.



In the past 12 months (Jan 2017-Jan 2018), LIFE Worldwide had 212,000 unique visitors, who made a total of 318,000 visits to the site, where they viewed a total of 810,000 individual pages.

LIFE website visitors are mainly acquired by organic searches (~75-80%), demonstrating that our content is relevant and discoverable by our target audience. We also get a significant proportion of direct visits (~15-20%), and a small minority via links from emails (<1%) or other websites (~5%). There are >500 active links to this website.

Around half of our user base is made up of visitors from the US (~30%), India (~10%) and the UK (~5-10%). Other countries making up a small minority (1-5%) of our users include the Philippines, Mexico, Canada, Spain, Australia, Nigeria, Malaysia, Colombia, Brazil, Pakistan, Thailand and Germany. Around 50% of visits use a desktop computer, ~45% use a mobile phone, and ~5% use a tablet. In the past year, around 5% switched from desktop computer to mobile phone, which is a trend we expect to grow in coming years. Accordingly, we are in the process of redesigning our guidelines section to be more easily viewed on mobile devices, making it more accessible to visitors from low- and middle-income countries.

The quarterly LIFE newsletter on major developments in the topic, especially related to public health, The twice-weekly news blog and quarterly email newsletter bring together highlights from the research community including clinical patterns, trends in treatment and new diagnostics, compressed into an easy-to-read format that is ideal for

FUNGAL INFECTION TRUST

TRUSTEES' REPORT

busy clinicians. Quarterly newsletters are sent out to 13,858 subscribers in English, which represents an increase of 17% this year. This quarter we revamped the format of the newsletter, which not only looks more appealing but also means that the proportion of subscribers viewing the full text of the newsletter has risen from 6% to 33%. The Chinese edition of the newsletter is now sent to 80 subscribers with over 50% viewing the full text and over 40% clicking through to the LIFE website. Feedback from recipients is very positive and has had clear effects on clinical practice:

"I just thought I would let you know that we diagnosed a case of post flu aspergillus last week and the reason we thought of the diagnosis was as a direct result of your email alert below." — Consultant in Wales

News items are focussed on issues of public health related to fungal disease, new diseases, antifungal resistance, therapy or clinical practice and are posted every 7-10 days.

A component of the LIFE effort was to boost public awareness of fungal infections generally. This has involved estimating the burden of serious fungal disease in over 75 countries, to highlight the seriousness of a range of primary and secondary fungal diseases. A special issue of the European Journal of Clinical Microbiology and Infectious Diseases was published in June 2017 and included fungal diseases burden estimates for South Korea, the Philippines, Thailand, Bangladesh, Pakistan, Uzbekistan, Algeria, Egypt, Portugal, Guatemala, Ecuador, Chile, Peru and Canada as well as an accompanying editorial entitled "Calling upon all Public Health Mycologists". Another series of papers was published in the J Fungi from January 2018 onwards. These new estimates bring to 75 the number of countries with fungal disease burden estimates done by the LIFE program over the last 5 years, many published: Algeria, Argentina, Austria, Australia, Bangladesh, Belgium, Belarus, Benin, Brazil, Burkina Faso, Cameroon, Canada, Chile, China, Colombia, Congo, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, France, Germany, Greece, Guatemala, Hungary, India, Indonesia, Iraq, Iran, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Madagascar, Malawi, Malaysia, Mexico, Mongolia, Mozambique, Nepal, Netherlands, New Zealand, Nigeria, Norway, Qatar, Pakistan, Peru, Philippines, Portugal, Romania, Russia, Saudi Arabia, Senegal, Serbia, Singapore, South Korea, Spain, Sri Lanka, Sweden, Tanzania, Thailand, Trinidad and Tobago, Turkey, Uganda, UK, Ukraine, Uruguay, Uzbekistan, Venezuela, Vietnam, Zambia. Published burden papers are available here: <https://www.gaffi.org/media/academic-papers/>. Those not yet published (but presented in abstract form at conferences) are all available on the LIFE website in the news section (<http://www.life-worldwide.org/media-centre/news>).

The FIT also supported a number of interesting and significant findings. There were 28 peer-reviewed publications and one book chapter in calendar year 2017 these relate to grants, burden of fungal disease estimates (as above) and infrastructure support in prior years and are shown in Appendix 1. The notable outputs included the first documentation of echinocandin resistance in *Aspergillus fumigatus* and the first UK isolation of a triple mutation conferring multiple azole resistance, also in *Aspergillus fumigatus*. Genetic abnormalities in severe asthma with fungal sensitisation were documented. Several advocacy and position papers were published regarding the need to improve fungal diagnostics as a component of controlling unnecessary antibiotic prescribing, and highlighting the problems of antifungal resistance around the world.

During the year grants were given to Manchester and Leeds universities to support research. In addition Travel and Living Allowance Grants for attendance and presentation at scientific conferences totalling £6,424 (2017 £5,480) were made during the year as part of the Trust's policy to support scientists in the early stages of their careers in mycology.

Who benefited from the Trust's Activities?

Researchers all over the world

Doctors all over the world, especially through the Drug Interactions database

Patients and their carers.

Students of medicine, pharmacy, biology and microbiology

The public – school children, their teachers and parents.

How do the Trust's Activities Benefit the Public?

The Aspergillus Website has been pivotal in making the topic easier to access for all users, creating strong online communities. There is a continual need to keep pace with the revolution in social media that has strongly influenced the development of communities on the World Wide Web.

In 2015, The Aspergillus Website added provision of live and recorded online events held by the National Aspergillosis Centre in Manchester, happening on a monthly basis. These provide several means of support including factual, social and information on present and possible future means to diagnose and treat aspergillosis.

FUNGAL INFECTION TRUST

TRUSTEES' REPORT

These recordings were viewed 250-450 times per month in 2018. Support for carers is being actively promoted via specialist speakers from the Manchester Carers Group. These meetings have spawned 6 regional group meetings across the UK, lead by patients.

The Patient's Website, affiliated to and managed by The Aspergillus Website team, has made it possible for patients to start writing (and update periodically) their own stories complete with pictures and in some cases have videoed patients telling parts of their stories. Website users now have use of Facebook pages for Aspergillus & Aspergillosis, Mycotoxin Research as well as Patients Support and all updates of the website are broadcast via Twitter (@AspergillusWeb).

Future plans

The Aspergillus Website continues to provide 25-50 new papers per month to registered users, as well as conference abstracts, meeting reports and more. The UK New General Data Protection Regulations (coming into force on 25th May 2018) change the way we may acquire and retain members and newsletter subscribers, forcing us to delete large numbers of members who have not been active recently, and who have not consented to long term storage of their data. This will likely mean a downward shift in numbers who receive the newsletter. It is intended to translate module 4 of the online Microscopy and Histology course into Spanish, French and Portuguese and the whole course into mandarin Chinese and Russian. The LIFE Educational video section will be gradually expanded, particularly to include radiology interpretation and diagnostic procedures.