

Medical Statistics - Providing Answers to Key Questions

Issues such as:

- does smoking cause cancer?
- what are the risks of being very overweight?
- how can we assess the effectiveness and safety of new drugs?
- is complementary medicine of benefit in the care of the terminally ill?
- how can the performance of hospitals and health care professionals be assessed?
- can computers be used to help doctors make more accurate diagnoses?

all involve the collection, analysis and interpretation of data. Clear assessment of all of the available evidence is vital. Medical statisticians play a key role in designing, analysing and interpreting studies to answer questions such as these in medicine, psychology, health studies and other related areas.

What Do Medical Statisticians Do?

Medical statisticians work closely with doctors and researchers to answer questions such as:

- who is most at risk from a particular disease?
- what effect does lifestyle have on the risk?

In hospitals, statisticians work with doctors and managers to assess the quality of care, answering questions such as:

- are patients being effectively treated?
- are patients satisfied with their treatment?

In the pharmaceutical industry the development of a new drug or treatment

from discovery of the compound through to full approval by government bodies takes approximately 12 years. All phases in the process - including how the drug is to be administered, assessing safety and efficacy, the effect on quality of life and long-term monitoring - require sound statistical advice and the medical statistician is involved throughout.

The Career Opportunities

In recent years medicine has become the largest single growth area in employment of people with good numeracy skills and training. There are many suitable job opportunities for trained medical statisticians. Currently there is a national shortage of qualified medical statisticians and demands for staff seem set to remain high. Career opportunities include the pharmaceutical industry as well as statistical posts in hospitals, medical research centres and the health services.

What Is the Job Like?

Medical statisticians typically work as part of a small multi-disciplinary team involving doctors, scientists, IT professionals and staff responsible for day-to-day data collection and recording.

Sophisticated modern computer hardware and software is used for data entry, data checking, data analysis and reporting, freeing the time of the medical statistician so that he/she can concentrate on ensuring that studies are well designed and carried out correctly, and results are correctly interpreted. Often the medical statistician must present results to doctors and managers who may have limited statistical training. Good communication skills and the willingness to work as part of a team are thus essential.

Salaries in industry are very competitive with excellent working environments (most major pharmaceutical companies have excellent sports and social facilities), good career prospects and training. Many medical statisticians get the opportunity to travel abroad and work on international studies.

How Can I Become a Medical Statistician?

Entry into a career as a medical statistician can be either by completing a degree course covering a substantial amount of applied statistics or by doing a specialist post-graduate course in medical statistics. A number of universities offer degree courses involving applied statistics and not all of these require mathematics A-Level. Degrees with an option to spend a year working in industry (sandwich placement) are particularly valued by employers.

Case Study - Samantha Allen

Samantha Allen followed the BSc Mathematics sandwich degree course at De Montfort University, graduating in 1994. Having spent her placement year at AXESS Ltd, a specialist contract company providing statistics and data management services to the pharmaceutical industry, she returned there after completing her studies.

Samantha completed her third year industrial placement within the Statistics and Data Management Team. "I had always enjoyed the statistical aspects of the course, but didn't know how I could translate this interest into a working environment. On my first day at AXESS I was given responsibility for the statistical analysis of data from a small clinical trial. Although I felt I'd been thrown in at the deep end, I was closely supervised and my colleagues were very helpful. I quickly learned how to apply the statistical and

programming techniques covered during my studies and also became aware of many other opportunities that exist within the industry. The opportunity to gain work experience allowed me to confirm that this was a career path I wanted to follow and the practical knowledge I acquired made it easier to find suitable employment after graduation.

My current role in the Contract Resourcing Group involves the recruitment of new statisticians into the industry and my experience in this position further confirms the enormous value of placements when starting work."

Case Study - Andy Stone

Andy Stone completed the joint Leicester and De Montfort University MSc in Medical Statistics in 1992 after studying Mathematics at Nottingham. He is currently a Senior Statistician at AstraZeneca Pharmaceuticals.

"I had always felt that I would enjoy a career in Statistics (although on completing my degree I was not aware of all of the opportunities). The year I spent on the MSc confirmed my interest, the course being varied, challenging and enjoyable. I realised there were many practical applications for the topics that I had previously studied.

The MSc gave me an excellent grounding for employment, so much so that I was quickly able to work unsupervised and apply techniques I had learnt to real data. The learning did not end when I finished the MSc as I've been continually expanding the knowledge I had gained, applying statistics to clinical trials investigating treatments in a variety of areas including breast cancer, migraine and heart disease. I have also further developed my communication skills by regularly presenting results and, more importantly, assuring that the correct interpretation is given."