

## Are you seeking a challenging career and a rewarding future?

### Health Informatics = Health + Technology + People + Information

#### In a world without Health Informatics...

*"Imagine Conor could be sitting here now if things didn't go so horribly wrong". "Yeah, I still don't really understand how all this could have happened".*

*"Look it's simple really. Conor wanted to see some obscure band on one of the smaller stages at the festival, and none of us were interested in going with him. When he blacked out over there, and the ambulance came, none of us even knew about it. We thought he'd found some of the other lads from school and linked up with them. Because he had no ID on him, the ambulance men couldn't even get in touch with his parents, so they didn't know anything about it until it was way too late".*

*"So they took him off to hospital – what happened then?"*

*"Well, when they got him to the hospital, he was still unconscious. Seemingly, when he fell, he hit his head off something sharp and got a bad gash, so they decided to give him some penicillin to make sure he didn't pick up an infection". "Oh no, didn't they know he was allergic to it?" "They didn't even know his name, let alone his allergies... So he ended up in intensive care, hooked up to a whole load of monitors and swollen all over. In fact it took them hours to even figure out that he was allergic to the antibiotic".*

*"And his parents still thought he was at the festival the whole time?" "Yep. And then, to make matters worse, that night the doctor who was in charge of him wrote down the medication to be given to him in the morning but his writing was so bad, that the nurse who came round in the morning misread it and gave him something totally different".*

*"Lucky he didn't die". "Yeah, I guess so, but then who wants to be going in for dialysis twice a week and waiting for a donor for the next few years..." "Yeah, I feel sorry for the parents too though. Imagine waking up to see your son's face on TV and being asked to contact the guards if you know who he is."*

In no area of life is information more critical than in health. *"Health care today is characterized by more to know, more to manage, more to watch, more to do, and more people involved in doing it"* (Institute of Medicine, 2001).

Errors in health systems are often reported in the media. Many of these are initiated by misinformation, miscommunication, misfiling, mishandling, misplacing, mislabelling, while some others are simply due to inadequate or inappropriate resource allocation.

*"There are estimated to be over 1.2 million doctor-patient interactions in major hospitals in Ireland each year. Statistics from other countries indicate that 10% of patients' experiences of healthcare systems can result in adverse events, with possibly one per cent having fatal consequences"* (irishhealth.com, April 2009).

There appears *"to be no precise figures for Ireland at present outlining the true incidence of adverse events directly related to treatment. Medication errors increased from 5,436 to 6,785 while treatment incidents increased from 3,808 to 5,373"* and the *"number of reported records/documentation errors increased from 2,650 to 5,070 last year"* (irishhealth.com, April 2009).



*"Our current methods of organizing and delivering care are unable to meet the expectations of patients and their families because the science and technologies involved in health care - the knowledge, skills, care interventions, devices and drugs - have advanced more rapidly than our ability to deliver them safely, effectively, and efficiently"* (Institute of Medicine, 2001).

There is now widespread international consensus and a growing body of evidence that information and communications technology (ICT) has the real potential to enable the delivery of a high-quality health care system where *"the right patient, receives the right treatment, at the right time, for the right reason, in the right location, with the right outcome in real time, at the right price"* (<http://endingthedocumentgame.gov/report.html>).

Within the processes of health care such as diagnosis, prognosis, patient management, treatment and discharge, computer systems and information systems

#### In a world with Health Informatics...

*"Wow Conor, tell us again what happened – go on". (Even though he had told the story 20 times before Conor was enjoying the limelight and didn't mind telling it again, especially as Jenny was in the audience!)*

*"Well, I went off the see 'The Plague' on one of the smaller stages at the festival. None of the lads wanted to go, so I headed off by myself. The last thing I remember was feeling dizzy and hitting the ground! I've had it before – my GP says it's to do with 'over-heating' when I'm dehydrated. I guess I was going a bit crazy to the music. But it's easily sorted – every time I get it I just have to get some liquids in me when I come round".*

*"Next thing I knew, I woke up in a hospital ward with a big gash on my head and Mum and Dad sitting over me. Dad said that, when I got to hospital, a nurse got my health card from my wallet and, when they swiped it, that gave them personal details and access to my unique health number."*

*"With that, they were able to get my health history from the net. It was just as well because they were going to give me penicillin in case I got an infection from the gash – until they saw that I was allergic to it. Instead they gave me something called erythromycin, which I can take without any bad side effects".*

*"They were also able to find out the reason for my blackouts, from my GP records. The doctor was able to diagnose the type of hydrating drip he wanted to put me on. In fact it was kinda cool! He typed it into a little hand held computer and it was sent to the nurses' station immediately. The nurse gave me the drip within 5 minutes. And they were able to get my Mum and Dad's contact details from my health card. So I woke up to find them beside me".*

*"Wow, you were lucky". "Yeah, I'd hate to think what could have happened if they weren't able to get at my information"...*

may be used by health care professionals (from allergists to oncologists to surgeons), patients and their families to inform their decision-making. Likewise systems of this nature are being used by managers and planners who focus on how to improve the delivery of this care within and across health care organisations.

Digital and mobile technologies are revolutionising health care delivery, providing health care professionals with access to your integrated health care information at the point of need. But health informatics involves more than just the technology - more than just using ICT to provide key stakeholders and allied health care professionals (such as health insurance providers, medical device and drug manufacturing companies) with access to accurate, timely and secure information.

Health informatics also encompasses:

- analysing current activities and processes within health care delivery systems
- taking a scientific approach to information which includes how we represent data, information and knowledge within systems, how we communicate this knowledge within the practice of health care and how we manage and measure the outcomes
- liaising with health care professionals to identify their requirements and expressing these requirements in a form that facilitates the delivery of solutions that match strategic health care needs
- designing, developing, testing and deploying information systems and computer systems to primarily support electronic health record management, patient monitoring, medical imaging, health care decision-making, medical diagnostics, telemedicine and telehealth care, performance improvement, billing and scheduling
- applying best practices in project management in health care settings
- evaluating the opportunities and limitations of ICT and of its impact in improving the efficiency and cost-effectiveness of health care
- utilising business intelligence tools where the focus is on finding and extracting useful patterns of information to gain a deeper understanding of health care issues and needs e.g. how different types of patients respond best to different treatments

all the while being cognisant of the fact that health informatics is not solely a technical discipline but focuses on the relationship between the technology and its use in real-world settings i.e. solutions are designed in context, taking into account the social, ethical, cultural, legal and regulatory factors and the organisational settings in which ICT will be used in health care sectors.

### **... but where can I hope to get employment?**

The health informatics specialist will:

- formulate, plan and implement health care information technology strategy
- engage with a range of stakeholders including health care professionals and information technology professionals to identify the need for communication, information and knowledge systems in a variety of health care settings
- express these requirements in a form that facilitates the delivery of solutions that match strategic health care needs
- develop, deploy and manage health information systems and computer systems
- undertake the acquisition, analysis and management of health care data, information and knowledge using ICT
- conduct training demonstrations, workshops and research

Since health informatics covers a broad spectrum of applications in the areas of patient care, health education, research and administration there are many opportunities for graduates to work in different settings within:

- Health informatics and medical software companies e.g. Cerner, dabl, Exodus Software, GE Healthcare, Helix Health, iAppLogic, Intelligent Health Systems, iSoft, Lincor Solutions, Quantum Health, Spacelabs Healthcare
- ICT-based companies that develop health care software applications as part of their activities e.g. Google, HP, IBM, Intel, Microsoft, Oracle, Philips, SAP
- Hospitals and other health care organisations
- Pharmaceutical companies and medical device companies
- Government and non-governmental agencies
- Public health organisations
- Consultancy companies
- Education and research

Typical employment roles include:

- Health Care IT Project Manager
- Health Systems Developer
- Health/Clinical Information Manager
- Health/Clinical Information Analyst
- Clinical Information Systems Specialist
- Health Information Security Manager
- Human Factors Specialist
- Health Care Webmaster
- Health Care IT Strategist
- Health Systems Trainer
- Quality Improvement Coordinator
- Systems Administrator
- Academic/Researcher

### **... and where can I find a course?**

If you are interested in making a difference to the lives of patients/clients and the health care professionals who treat them, enjoy working with others, like problem solving, critical thinking and using computers you may wish to consider applying for the BSc in Health Informatics (Course code: LM023) or the MSc in Health Informatics (Course Code: LM635).

Further information on these programmes can be obtained by contacting:

Annette McElligott

**Tel:** 061-202724

**Email:** annette.mcelligott@ul.ie

and by visiting

- <http://www.csis.ul.ie/course/LM023/>
- <http://www.csis.ul.ie/course/LM635/>

