Highlights – Euro-DEM 2018 Chair: Dr Wolf Hautz

Superb Keynotes:

- **Sir Liam Donaldson** Acknowledged dx error as an international issue. The issue needs to move beyond the interest of academics and enthusiasts to become something that is being addressed in clinical practice.

- **Gerd Gigerenzer and Wolfgang Gaissmaier** Illustrated the power of simple heuristics to solve complex problems, especially those involving uncertainty. Presented early data on the power of teamwork: With collaborator (and Conference Chair) Wolf Hautz – found that pairs of 2 senior students improved diagnostic accuracy by 30% by working together.

Selected highlights:

**Christiana** expanded on that for understanding the problem of overdiagnosis and asked us to watch out for 3 key misconceptions: 1) Earlier is better. 2) If it’s good for you it’s good for me. 3) The more data the better.

**Olga Kostopoulou** presented convincing data on how algorithms and decision support can improve diagnosis. Discussed ‘Algorithm Aversion’ – the tendency for physicians to distrust algorithms and avoid using them. Found that if you let users tweak the results, they are more likely to use these tools, albeit with a minor degradation of impact.

**Kersten Ritter** reviewed advances in machine learning (requires manual feature extraction) and deep learning (can capture variation too subtle for human perception). Best performance to date is in visual diagnosis (radiology, retinal imaging, etc). Reviewed the concerns of bias and misclassification, and the ‘Black Box Problem’ – how the AI system work is opaque.

**Hardeep Singh** summarized lessons from research: We need to focus on common diseases, use a socio-technical perspective, and study the process, not just the outcomes; We are no where close to agreement on how to measure, how to define, how to prevent, but its ok: We’re just at the start of this work, and whatever we do and wherever we look we will learn. Things we could do tomorrow include: Talking to radiology and lab; clarifying responsibility for follow-up; verbally communicating critical test results; learning from errors; and working to improve calibration. **Gordon Caldwell** suggested the use of regular breaks during the work day to keep cognition fresh.

**Tobais Mueller** reviewed the challenge of diagnosing rare diseases. “Harrison’s” text of internal medicine contains about 750 ‘common’ diseases; Centers that specialize in rare diseases deal with the other 8000+. Illustrated how decision support tools like Isabel and ZebraFind can help.

**Sue Sheridan** reviewed the many ways that involving patients can improve the diagnostic process. WHAT IF patients were partners in our research, in designing our systems, and improving them. She also reviewed the substantial success that has been realized in reducing
the misdiagnosis of kernicterus, efforts she helped lead, as an example of how to improve diagnosis one disease at a time.

David Newman-Toker pointed out the focusing on specific diseases gets you much closer to interventions to improve care in the real world. Half of dx error involves 15 specific disease in the fields of cancer, cardiovascular disease, and infections. Misdx of stroke is the #1 problem in the vascular category: 9% of strokes are missed at first contact (vs < 2% for MI), with 100,000 missed\wrong dx of stroke in the US annually. Many of this involve the misdx of dizziness; physicians perform worse than chance alone in evaluating patients with dizziness for stroke. This is not a problem with cognitive bias, its lack of knowledge and skills, and these can be directly addressed through training, better teamwork, and technology. One simple eye test, if you can perform it correctly is better than most imaging tests in predicting stroke.

Yoryos Lyratzopoulos reviewed advances in early cancer diagnosis, such as programs in the UK to expedite specialist evaluation. Much has been learned about using population data to improve dx, which age groups to target, which cancers, how to use the right algorithms on the right populations. Reviewed the ‘CAN-TEST’ collaborative – 4 centers in the UK, with international collaborators, studying how to improve cancer dx in the UK.

Wolf Hautz and Julianne Kammer discussed dx error in the ER, and their findings that misdiagnosed patients stay on average 3 more days in the hospital and their odds of death double. Their studies of teamwork showed great promise to improve accuracy, and they have developed a simulation tool that allows studies on accuracy and calibration.
Hardeep Singh, Paul Epner, Mark Graber, David Newman-Toker, Wolfgang Gaissmaier, Gerd Gigerenzer

Yoryos Lyratzopoulos

David Newman-Toker

Mark, Charlotte, Geoff Norman, Laura Zwaan, ...Hardeep Singh, Kathryn Lambe

Inge Hege

Sandra Monteiro