**Minutes**
**Cross-Party Group on Life Sciences**
**Tuesday 28th of May 2019, Committee Room 5**
**Sir Harry Burns and Dr Holly Butler**

**MSPs Present:**
Graham Simpson MSP; Vice Convener
Tom Mason MSP

**Apologies:**
Kenneth Gibson MSP; Convener
Ivan McKee MSP
Miles Briggs MSP
Willie Rennie MSP

## Opening, Welcome and Introductions

The Convener, Graham Simpson MSP, welcomed everyone to the sixth meeting of the Cross-Party Group (CPG) and outlined the discussion points for the session.

## Minutes of the previous meeting (5th February 2019)

The minutes of the previous meeting were accepted by the group and seconded by Alison Culpan.

## Sir Harry Burns, Professor of Global Public Health, University of Strathclyde

Sir Harry Burns argued for a change in the way we address health problems and called for a whole system approach rather than the single interventions we currently make.

- Scottish life expectancy has historically been in the middle of European averages but in recent years has dropped. Linear thinking, where we focus on a problem, cause and solution has oversimplified the approach to socially determined ill health according to Sir Harry Burns.
- In Scotland, there is a wide gap in life expectancy between rich and poor communities and our collective health record is a reflection of those who are worst off. Recent findings have shown that health inequality is not at its widest in older people but those who are in their teenage years and between the ages of 20-30. Heart disease, for instance, is only a minor player in health inequality when compared with drugs, alcohol and suicide.
- Sir Harry discussed the connection between so called “deaths of despair” in the USA where high levels of mortality in Caucasian, blue-collar communities is linked to patients not caring whether they live or die and embarking in destructive behaviour.
- Sir Harry then explained the theory of Salutogenisis (named after the Roman goddess of safety, Salus) which is the study of wellbeing.
- According to this theory a sense of coherence is critical to wellbeing and this was backed up by a study from Anon Antonovsky on holocaust survivors.

- Better health outcomes tend to follow those who view the world as meaningful, manageable, and one they can engage with. Failing to have this outlook results in chronic stress and poorer choices.
- This was evidenced by a study in New York on primates where stress was measured in young monkeys with good food security, insecurity or a combination of both. Primates with predictable and insecure feeding patterns had less stress whilst those subjected to random feeding had higher levels of stress in addition to developmental issues.
- Sir Harry explained that this was mirrored in humans and was confirmed by a study in Glasgow which scanned the brains of both deprived and affluent people. The results revealed that those with chaotic upbringings, where needs were not responded to (crying babies experiencing neglect), resulted in an underdevelopment of the hippocampus and prefrontal cortex which are responsible for learning and processing information. In practice these study participants were slower at processing information by up to 200 milliseconds and were unable to make good decisions.
- Conversely, these test subjects also exhibited an overdeveloped amygdala, the part which guards emotions, which manifested itself in children lashing out physically often resulting in spells out of education.
- Sir Harry turned to Maslow's Hierarchy, where food and safety are the basis for wellbeing, and called for it to be turned upside down creating an inverse pyramid where self-actualisation is the basis of wellbeing.
- The ability to choose and make decisions can empower those who are worst off. Sir Harry mentioned studies in Stoke and London (Broadway experiment) where homeless people were asked "what they needed" and were made leaders in their own wellbeing. Following this study, the Economist concluded that the most efficient way to spend money on the homeless might be to give it to them.
- Sir Harry has worked on a "what matters to you approach" where those at risk were asked what they needed which often resulted in small, inexpensive interventions to prevent problems from snowballing. Helping people solve problems rather than doing it for them has proven to be far more successful in these instances.
- Finally, he explained that building change from the frontline upwards was the only way to achieve success. He explained that the success of the Patient safety Programme in Scotland (which has seen a 36% reduction in post-operative deaths) was built on this foundation.

*Key points from the Q and A with Sir Harry Burns:*

- Sir Harry revealed that the brain can repair itself from adverse childhood events as late as 60 and can be done through a mixture of exercise, strong social connections, an invested sponsor and mindfulness.
- When asked about scaling up these solutions Sir Harry explained that it wasn't so much a funding issue but a change in approach was required from frontline staff. Doing this successfully could be worth over £2bn to the economy.
- Sir Harry finished by saying that predictive analytics and data was required to run studies to prove his methods in large populations. Unfortunately, the system is not tooled up to provide this.

**Dr Holly Butler, Research Director, ClinSpec Diagnostics**

Dr Holly Butler explained how ClinSpec Diagnostics grew out of the PHD work of Dr Matthew Baker and is aimed at improving the speed at which brain cancer is diagnosed.

- As it stands, on average, patients have five GP appointments before brain cancer is diagnosed which results in both treatment delays and poorer outcomes. Dr Butler explained that 62% of cases were diagnosed in an emergency setting.
- Currently, there is no cost-effective or easy way to diagnose brain cancer and sending every patient reporting with general symptoms for an MRI or CT scan is inefficient and financially challenging.
- ClinSpec diagnostics proprietary technology works by taking a blood sample and using machine learning to analyse it against a patient database, to check for the probability of brain cancer. From here, patients can be referred to an MRI or CT scan for further diagnosis. The ClinSpec technology works primarily as a primary care triage tool.
- Dr Butler explained that their technology works by shining light on molecules, causing them to vibrate and from here they can detect disease. The test takes 10 minutes to provide a result in PDF form and is cost effective thanks to the fundamental changes ClinSpec have made to the infrared spectroscopy through disposable samples.
- A key part of this technology is their Triage ID algorithm which tracks the likelihood of disease against patients who already have brain cancer. So far this has been used against 724 patients with over 90% predictability.
- Dr Butler explained that eight out of ten brain cancer sufferers have to stop work with the overall cost to the economy totalling £578m; the third highest of all cancers.
- ClinSpec diagnostics has benefitted from Scottish Enterprise support as a high growth spin-out company from the University of Strathclyde and has received help to define their market, commercial need and technology development. They have also benefited from funding from private equity, the Scottish Investment Bank and Innovate UK, totaling almost £1.6 million.
- ClinSpec's USP is that their test is not reliant on a single biomarker to detect cancer and their machine learning has improved both accuracy and sensitivity which enables the detection of both high- and low-grade tumours.
- Dr Butler explained that ClinSpec is currently working with the NHS Lothian, where an open access CT scanning scheme has revealed that only one in 60 brain scans detected cancer. When ClinSpec retrospectively scanned these patients, their test reduced the number of unnecessary scans to just one in ten which could save the NHS significant sums in diagnostics.
- Dr Butler stated that having access to more patients and data sets was critical to their future success, with a further 600 required to improve accuracy. These further trials will form part of a multi-centre trial which will help the technology move towards regulatory approval. This stage will require a further £4m of funding.
- Dr Butler finished by explaining that they were in the initial stages of adapting their technology to detect other cancers.

*Key points from the Q and A with Dr Butler*

- Dr Butler was asked about the applicability of their technology to other diseases, including rare diseases, and she explained that there was no ceiling on its usage but the initial decision to focus on brain cancer was as a result of an unmet need in this area.
- She was also asked about whether their technology can help guide treatment pathways and she stated that it could work in partnership with biopsies to guide treatment.
- On regulatory uncertainty Dr Butler explained that clarity was needed around Brexit and that, curiously, the FDA route offered greater certainty.
- She also said that understanding current procurement and tendering arrangements with the NHS was a priority.

- Finally, when asked about challenges, she explained that ultimately recruiting patients and obtaining better data sets are the biggest barriers to success.

**7. Closing Remarks**

The vice convener thanked both contributors and reminded members of the date for the next meeting (8th October 5:45pm CR4).

He also encouraged members to put forward suggestions to cover at the next meeting.

**Non-MSP attendees:**

Damian Crombie (Astra Zeneca), Alison Culpan (ABPI), Claire Headspeath (ABPI), Graeme Rose (ABPI), Holly Butler (ClinSpec Diagnostics), Mark Hegarty (ClinSpec Diagnostics), Matthew Baker (ClinSpec Diagnostics), Sir Harry Burns (Strathclyde University), Aileen Bryson (Royale Pharmaceutical Society), Andrew Dempsey (Celgene), Barbara Blaney (The University of Edinburgh), David Eadie (Novo Nordisk), Emma Lockhart (Novo Nordisk), George Davison (GSK), Greg Stevenson (Roche), Heather Ann Baxter (Lilly), Ian Weather (Ipsen), Jacqui Young (Roche), James Crichton (Scottish Government), Jamie Hodgson (Antibody Analytics), Jennie Hampson (Kyowakirin), Sarah Nimmo (Ettrickburn), John MacGill (Ettrickburn), Joyce Tait (University of Edinburgh), Keith Robson (MS Society Scotland), Ken Sutherland (Canon Medical Research), Maggie Clark (Novartis), Marion Butchart (Novartis), Mathew Hilferty (Alliance), Matt Barclay (Community Pharmacy Scotland), Robert Crawford (Novartis), Rose Marie Parr (Scottish Government), Rory Duncan (Heriot Watt University), Steven Burke (PPD), Sally Hughes (Tevauk), Ronnie Palin (Life and Chemical Sciences), Tracey Bowden (Pfizer), Sandra Auld (Healthcare Public Affairs), Zieda Taylor (Chiesi).