

The Evolving Story of Public Health in Aberdeen University over 125 years

Public health is a broad field, and although the fundamental task of protecting the public's health has not changed, its priorities and organization within UK health have undergone continuous change and development over 125 years. Public health continues to be defined as "the science and art of preventing disease, prolonging life and promoting health through the organised efforts of society". The public health approach is based on populations and on partnership and inter-disciplinary working. It recognises the wider determinants of health such as nutrition, genetics, education, housing, the environment, employment, lifestyles, and life circumstances as well as socio-economic inequalities. However the challenges to health of the population have continued to change over 125 years and public health has evolved to meet these new challenges.

Within the University, public health started life as a combined department with forensic medicine under the leadership of Professor Matthew Hay, who became a famous figure in Aberdeen medicine (1). He was a brilliant intellectual and researcher and was appointed to the Chair of Forensic Medicine in 1883, aged 27. Because of the growing public interest in public health, and Matthew Hay's own interest in the social causes of illness, this was changed in 1895 to Forensic Medicine and Public Health. Simultaneously he was the Medical Officer of Health (MOH) for Aberdeen City from 1888-1923, and in 1916 he launched his vision to create one site for all hospitals in the city – what became the Joint Hospitals Scheme and the Foresterhill complex. (1)

Matthew Hay's annual reports as MOH presaged the remarkable changes in public health that occurred in the 20th Century(C). He was deeply concerned about redressing the differences between rich and poor citizens - in his day, between the east and west of the City; and he foresaw the creation of a State Health Service that would integrate treatment and prevention, and the growing importance of the latter as the means of improving the public's health. Aberdeen city was a leader in the UK in focusing on health education. His concept of integrating hospital services led to Foresterhill being one of the first centres in the UK to develop "peripheral" consultant clinics i.e. to take care to the patients in their own location.

In 1914 the University appointed a separate Lecturer in Public Health, Dr. John Parlane Kinloch, known as a man of vision and a superb teacher. He was Head of Department

from 1924-29, and then went on to be the Chief Medical Officer for Scotland. In Aberdeen, he was notable for his opposition, as MOH, to the Joint Hospitals Scheme; he thought that, although the idea was valuable, the maintenance costs would be crippling and should not fall on either the public or the Town Council unless the latter also controlled the expenditure. He lost the argument. He was followed, in Aberdeen, by Dr Harry Rae (1929-47) and Dr David Berry (1947-57), who maintained and developed the teaching but focussed mainly on their role as MosH.

In 1950, in line with the major concern with social conditions in the UK after WW2, the University created a chair of Social Medicine. The Beveridge Report of 1942 led to the creation of the Welfare State and the NHS in 1948, so it appeared that clinical care would be available to all but, in the spirit of prevention, that there was a need to understand how social conditions related to illness and how these could be modified. The Chair was not filled until 1958, by Professor Maurice Backett, who moved in 1969 to University of Nottingham, where he expanded his work with the World Health Organisation (WHO) on developing health education in poorer countries, including the establishing of a new University in Kong Kaen in north-east Thailand. Maurice Backett brought to the Medical School in Aberdeen an international array of visiting experts and researchers who thereby also contributed to undergraduate and post graduate teaching. He himself was a charismatic and inventive teacher who fostered a substantial cohort of medical graduates with a greater experience and understanding of the determinants of disease and health as they arise from different modes of living. His legacy for Social Medicine in Aberdeen was a focus on innovation in health research and care which the Department, albeit under different titles, continued to develop.

He was followed by Professor Roy Weir (1969-90), who took the Department in a new direction. Aberdeen has a long history of Town and Gown collaboration, and that was fundamental to the developments of the 1970s onwards. As with other clinical disciplines in the Medical School, doctors working in academic social medicine also had appointments in the NHS. Most of the work in the community was, and still is, in infection control and in prevention of both infectious and chronic disease but the underlying science in both settings is epidemiology and, although the medical and social challenges for prevention changed markedly over the 20th C and still do, the investigative skill remains epidemiology.

Fundamental to epidemiology is the use of data about the topic being studied, and that data has to be as accurate, complete and consistent as possible otherwise the conclusions drawn from it will be worse than useless; they will be misleading. With the increase in chronic diseases - because of improved survival and increasing life-spans - there was growing awareness of the need for routinely collected data that allowed events along a patient's pathway to be linked not just to study medical conditions but also so that progress could be related to an initial intervention. To set this up for the whole NHS would be costly of trained records staff, and therefore it was imperative that new information systems were planned to be as accurate and complete as possible, and could be used fairly easily to answer questions that would inform, indeed stimulate, improvements in medical care and services.

Aberdeen and North-East Scotland were, and are, ideally placed to pursue the idea of patient pathways and routine follow up of patients after events and hospital-based interventions. First, the population is relatively stable, sited as it is between the mountains to the west and the sea to the east and with traditional occupations such as farming and fishing (and even the influx of the oil industry at the end of the 60s did not much change the basic population). Secondly, and crucially, virtually all hospital services were based in or provided from Aberdeen, with only one specialist team in each specialty which was responsible for outreach across the North-East including Orkney and Shetland. The first linked databank in the North-East was the Aberdeen Maternity and Neonatal Databank, set up by Sir Dugald Baird in 1950 and still running, for epidemiological research in maternal health and especially the association between social factors and birth outcomes. The North-East Psychiatric Case Register was created in 1962 to link all hospital admissions for any one psychiatric patient and run by Dr John Baldwin, who later moved to the Oxford Record Linkage Unit. In 1965 Dr George Innes, initially a psychiatrist and the originator of the idea of the Psychiatric Case Register to link patients events(5), moved to Social Medicine and went on to direct the joint NHS-University Health Services Research and Intelligence Unit and develop epidemiological and evaluative studies using its database.

Roy Weir's aim was to develop a general hospitals computer-linked information system based on patients not hospitals, and to use these linked data, using a single patient

identifier, to relate interventions to outcomes in individual patients whether in hospital or at home. With Dr. James Crooks in Materia Medica, first came a Medicines Evaluation and Monitoring Unit, which introduced a drug kardex for all hospital patients in the Aberdeen General Hospitals Group and thereby monitored both prescribing behaviour and potentially adverse reactions to drug treatments for each diagnosis. The Automated Thyroid Follow-up Register (which was adopted throughout Scotland) followed, and the development of computerised record summaries which linked outpatient and general practice information and greatly reduced the need for outpatient attendance. In the 1970s he concentrated on the outcomes and value of care, which led to the Health Economics Research Unit. The Health Services Research Unit followed in the 1980s to develop more accurate methods of measuring and assessing the effectiveness of clinical and health care interventions, including clinical trials. In 2017 the two Units were awarded the Queen's Anniversary Prize for work of long term outstanding excellence in innovation, education, and benefit to the health and medical care of the public. Arguably, by transforming health care, they have saved and improved as many lives as the more publicly recognised innovations in medical technologies.

IN the Rowett Research Institute, Professor Geraldine McNeil developed the profile of public health nutrition. In 1986 she moved to the University to establish a Human Nutrition Unit at the Rowett, which in 2017 itself moved into the University of Aberdeen and the Foresterhill campus. She developed a Masters degree in Public Health Nutrition, which is still a popular course. Her nutrition research produced innovative methodology in dietary assessment and in demonstrating the relationships between diet and health outcomes ranging from obesity, cardiovascular disease, cancer and cognitive decline in adults and obesity, asthma and dental disease in children.

Roy Weir left in 1990 to become Chief Scientist in the Scottish Office and was followed in the chair by Prof Elizabeth Russell (1991-2001), the first female professor in the medical faculty. Under the leadership of Professor Russell the scope of public health was significantly widened beyond medicine to embrace a truly multidisciplinary approach, both within Scotland and locally. This change was reflected in the opening up of access to candidates from a wide range of backgrounds with interest in a career in the field of health, whether health service or research, by for example creating degrees in Health Sciences in Aberdeen.

The name Social Medicine was dropped with the abolition of the chair when Elizabeth Russell retired in 2001. The public health and epidemiology component was well developed by Prof Cairns Smith, the next head of the Public Health Department, who led the development and was the initial Director of the restructured Institute of Applied Health Sciences. Under Professor Smith's leadership the Department developed research interests in the epidemiology of chronic diseases, in data science and in international health with a specific focus on chronic mycobacterial diseases such as leprosy, nutrition and maternal health.

Over the next 20 years the Department contributed to the development of evidence based public health through generating epidemiological evidence as well as systematic reviewing, critical appraisal and synthesis of qualitative and quantitative evidence. This rigorous approach was applied to a wide range of non-communicable disease topics such as nutritional health, international health, maternal health, surgical interventions and renal disease. Professor Norman Waugh contributed a large number of reviews to the National Institute of Clinical and Health Excellence and methodological work on appraising evidence. Professor Gary McFarlane led the development of Epidemiology with a focus on methodology and exemplified in field of musculoskeletal disease, while Prof McNeil led public health nutrition research, and made a significant contribution over the same period to training and capacity building in multidisciplinary public health.

The content of teaching by staff in public health has changed considerably over the years both to reflect changes in health problems and health services (2) and, in respect of medical undergraduates, also when the undergraduate medical curriculum was revised in the 1990s to focus on a problem-solving approach, when public health teaching to medical students was integrated with that of primary care. The interdisciplinary approach begun in the 80s with the degrees in health sciences, and the input of epidemiology to degrees in other subjects such as sports science and biology, has continued to the pattern at the time of writing, namely the Masters degrees in public health, including an online version, and nutrition, both clinical and human. These attract large numbers of candidates locally, nationally and internationally. These programmes were important in establishing the international reputation of public health at the University of Aberdeen and continue to underpin this today. But the basic content,

of epidemiological method and evaluation of the effectiveness of health interventions, remains the same.

In 2008, the Department of Public Health became an integral part of the Institute of Applied Health Sciences within the College of Life Sciences and Medicine of the University of Aberdeen. The research programme of the Department formed part of the research strategy of the Institute of Applied Health Sciences; and the teaching programmes of the Department became part of the undergraduate and postgraduate teaching of the School of Medicine and Graduate School within the College.

Cairns Smith retired in 2011 but continues to lead public health work internationally in the rapidly emerging arena of Neglected Tropical Diseases working with the World Health Organisation, international non-governmental organisations, research institutions and pharma industry. Much of this work is focused on elimination and eradication of specific diseases particularly in the global challenge to eradicate leprosy through a new Partnership for Zero Leprosy working with the Task Force for Global Health.

In 2015, Professor Corri Black was appointed as Chair of Public Health and at the time of writing is leading a modern era in Public Health research that builds on the legacy that Prof. Baird, Dr Baldwin and Prof. Weir established in Aberdeen when they created world leading data resources and pioneered the principles of data linkage. “Big data” analysis is now a widely used social research technique, linking data from multiple sources; in the last 10 years, Aberdeen has been at the vanguard of creating digital cohorts, using electronic health records to link data from birth across the life course to understand the determinants of disease and using these data to understand and predict outcomes as well as underpin health service evaluation. These data have the advantage that they were collected for the main purposes for which they are now being used, and are therefore both fit for purpose and with high accuracy. Prof. Black led the establishment of the Grampian Data Safe Haven, in partnership with NHS Grampian Public Health – Health Intelligence and University of Aberdeen IT services, to provide rigorous governance and data security while fostering collaboration in health data science. The facility became an accredited safe haven in the Scottish federated network in 2016.

The creation of the School of Medicine, Medical Science and Nutrition brought new collaborations for researchers in population health data science, leading work in chronic disease, acute health events, women and child health, mental health and cognitive health. These partnerships are underpinned by the exceptional data resources in Aberdeen. The Aberdeen Birth Cohorts (1921, 1936 and 1950s) have been revitalised through efficient digital cohort follow up. Work led by Prof. Black with the Children of the 1950s provides a national exemplar through the Administrative Data Science Centres for the importance of linked data across sectors (education, government, environment, biological, imaging and health) to understand the complexity of determinants of health at the interface between social, biological, health and computing sciences.

In 2017, Prof. Black launched the Aberdeen Centre for Health Data Science. Elizabeth Russell recognised and established the principles of interdisciplinary research. The new centre builds on this to create a North Scotland ecosystem for health data science bringing a team science approach across health informatics, bioimaging, bioinformatics and computing science in partnership with NHS, clinical team, patients and the population.

Throughout its life, public health in the University of Aberdeen has aimed

- To monitor the ever changing health of human populations and to improve understanding of the distribution and determinants of disease ;
- To investigate innovative and cost-effective methods to prevent disease, improve health and provide health care; and
- To teach the principles and practice of public health through undergraduate and postgraduate programmes to the next public health generation.

These aims continue today across the research and teaching programmes of the Institute of Applied Health Science.

Bibliography

1. Aberdeen Medico-Chirurgical Society, A Bicentennial History 1789-1989. George P Milne (ed.); AUP 1989.
2. Innes G, Sharp G.A. (1962). A Study of Psychiatric Patients in North-East Scotland. *J Ment. Sci.*108: 447-56.
3. <https://www.abdn.ac.uk/iahs/research/obsgynae/amnd/index.php>
4. Computers in the Service of Medicine, pp151-162 R.D. Weir, J Crooks, D.C.Coull, Nuffield Provincial Hospitals Trust, 1968.
5. Monitoring for Drug Safety. Editor W. H.W. Inman, Monitoring for Drug Safety, P277-289 D.C.Moir MTP Press Ltd,1986
6. Community Medicine, a study guide. Weir RD, Innes G, Russell EM. Heinemann Medical, 1988.