The Royal Society of Queensland Inc.
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COMMUNITY HEALTH:
An interdisciplinary dialogue on the evidence base for investment

Monday 30th May 2016 1pm–5pm
Cairns Institute James Cook University Cairns

PREAMBLE

Purpose of the event
This workshop aimed to:
- bring current research to the attention of experts and the public;
- foster cross-disciplinary dialogue;
- bridge scholarship and policy;
- produce policy conclusions in a format suitable for action by stakeholders.

Original rationale for convening the event
The organisers were concerned that experienced professionals hold different views about the best way to improve community health; and that the programs available to address systemically poor health are fragmented.

Professionals proposing pathways to good health tend to emphasise solutions embraced by their primary discipline, shaped by the cultures and policies of the organisations in which they are employed. Further, services are delivered by a complex array of entities ranging from NGO-provided charities to official hospital services driven by appointed boards but constrained by State budget allocations and performance indicators.

Scientific method is an aid to progress in a complex field like this. Scientists are traditionally trained to specialise in searching for causation through evidence-led enquiry. Which preconditions of good health or of ill health are most fundamental and most ripe for remedial investment? For example, is diet, vitamin deficiency, parasite load, socio-economic disadvantage, discrimination, poor education or failure of civic services most foundational?

The Royal Society of Queensland
The Society is the oldest scientific institution in Queensland. It is successor to the Philosophical Society of Queensland, founded in 1859. It issued the first of its annual *Proceedings* in 1884. The Governor of Queensland His Excellency The Honourable Paul de Jersey AC is Patron of the Society.

The Society seeks to increase awareness of the sciences in Queensland and provides a means for both scientists and lay people to involve themselves in the progress of science. The Society advocates on behalf of science and scientists but is not politically aligned and as a learned society, is not activist.

The scope of its activity is “science and the application of science”, including science-related education and policy, not limited to the natural sciences. It publishes original research and scientific opinion in the natural sciences. It encourages original research

and the application of scientific method and knowledge to policy-making and decision-making.

Further information is available from its website http://www.royalsocietyqld.org.au/ .

Alignment with current and historical interests
The Royal Society of Queensland is a generalist learned society with a long tradition of fostering curiosity-led enquiry. It has no current policy position on community health and its primary aim in hosting this event is to improve inter-disciplinary dialogue.

The Society has held an interest in public health from its earliest days. The first published paper, in 1859, was by Dr Frederick Barton on asphyxia, the second on ventilation of buildings. Other early papers covered public sanitation and the water supply for Brisbane.

The Australian Institute of Tropical Health and Medicine (AITHM) has described its current main research interest:

> "…complex interactions between chronic and infectious diseases and the differing patterns of prevalence of these diseases between climatic zones, racial groups and between metropolitan and rural and remote populations."

Chronic disease is the theme for its international congress in September. The Cairns workshop explored this theme on a broader canvas, bringing the knowledge of the Institute to the attention of scholars and practitioners in related fields.

Format
The workshop was open to the public. Attendees represented a number of sectors active in community health in North Queensland (defined as stretching from about Townsville to Cape York). Regional members of the Royal Society were prominent. Contributors were invited to present on the following question:

> "How should a hypothetical $100 million be allocated over a ten-year period to maximise value for money in improving community health in the region?

Both keynote and short presentations were heard, then a roundtable plenary session teased out insights from individuals.

Program
1pm Bernie Singleton
Welcome to Country
Geoff Edwards, Royal Society President – Instruction and Context
Professor Robyn McDermott, Senior Clinical Research Fellow and
Director for the Centre for Chronic Disease Prevention James Cook University
Where are we spending money on health vs Where SHOULD we be spending
Professor Jonathan Golledge, Surgeon, Professor of Vascular Surgery and
Director of the Queensland Research Centre for Peripheral Vascular Disease.
Is self-management of chronic artery diseases an approach to improve community outcomes and how can we facilitate this?
Dr Emily Callander, Health Economist James Cook University
Impact of chronic disease on labour force participation, family income and income poverty.
Kurt Pudniks, Director of Digital Physics Pty Ltd consulting on modelling, simulation, and optimisation"
Introduction to datamining and association rules i.e. the free software tool "R" including the add-on package "arules"...

General Discussion

5pm Close

Acknowledgements
The generosity of Prof Louis Schofield and the AITHM in providing a venue and sponsoring the event is greatly appreciated.

Ms Jacqui Lavis, Independent Indigenous Health Researcher, was the primary organiser : jacquilavis545@gmail.com .

The Royal Society of Queensland thanks presenters for the time they invested in preparing for the event; and all attendees, particularly those who travelled from Townsville just for the occasion.

PRESENTATIONS

Dr Robyn McDermott
Australians are living longer, but with proportionately less well-being; and there is an increasing rate of obesity in young people. Obesity has been rising since the early 1980s, even justifying the term "epidemic". The prevalence of excessive body weight in adult males of working age is now some three times that of smoking. Diabetes has followed obesity. Globalisation of the food industry, polarised rhetoric of 'individual responsibility' v. 'nanny state' and the business agenda of deregulation have steered policy away from preventative health.

Despite official pride in universal access, 30% of the costs of the health system are private payments. Health expenditure is now running at about 9.5% of GDP, having risen from about 6.5% in 1990.

Heading away from the major cities to regional and remote centres, primary medical care proportionately decreases and hospitalisation increases, in an inverse relationship, with a parallel increase in costs.

The cost of drugs is 14-15% of the total cost of health care. Five statins alone accounted for 21 million scripts costing $1.327 billion per annum in year ending June 2010 (out of $8.4 billion total PBS expenditure). Drugs paid by the taxpayer to treat chronic disease can become a substitute for a healthy lifestyle (characterised as the medicalisation of ill health). Considering the top 10 drugs by prescription count, the seven that are not antibiotics are for chronic diseases and are taken regularly. Once a patient is on the regimen, it is difficult to stop and doctors are reluctant to withdraw the medicine. The usual pattern is for patients to accumulate more chronic prescribed medications as they age. This leads to a high rate of adverse drug events in the elderly such that around 20% of preventable hospitalisations in the over-75 year-olds are for adverse drug events.

The cost of drugs to treat obesity-driven Type II diabetes is an example of a wider phenomenon of the medicalisation of risk, where drugs are a substitute for lifestyle change. Whereas drugs for diabetes treatment are subsidised, healthy food and regular physical activity are not, and appear to be less accessible to people on lower incomes.

In the first year of a sugar tax in Mexico, consumption fell by more than 10%. In Australia, policy is so ideologically driven that it is difficult to even debate the economics of preventative health seriously.

Public policy is heading in the wrong direction. Public health and community health are being defunded and regulation of the food industry not prominent in public policy

discourse. Childhood obesity should be viewed as a child protection issue and funded accordingly.

Dr John Golledge
Dr Golledge commenced by observing that blockages in the arteries of the lower limbs are estimated to affect about 20% of people older than 50, about 200 million people worldwide (2010 figures). Between 2000 and 2010, there was a 29% increase in peripheral artery disease in low and middle income countries, though only 13% in high income countries.

Angioplasty and related surgery is the mainstream treatment for acute cases of peripheral artery disease. Some 14,000 stents are inserted in patients annually in Australia, but arteries react after the operation by laying down deposits distal to the stents. There is also a risk of clots. More durable treatments are needed.

The extent of limitation to mobility (such as results of a six minute walk test) is a fair predictor of how long a patient with blocked arteries will live.

Supervised walking exercise (by personal guide) has been shown to be effective, but is unpopular with patients and is not available on the public health system. Unsupervised exercise at home was shown in a 2013 study as much less effective, as patients felt they had an acute problem that could be fixed by surgery and believed that exercise worsened their problem.

Dr Golledge has been impressed with the results from that study and is now launching a trial of his own. He is seeking 200 subjects with blocked arteries or cardiovascular disease either for interview (two sessions with a psychologist plus follow-up) or as controls. Location Townsville, Brisbane or Sydney.

Dr Emily Callander
(As result of an accident that morning, Dr Callander was not able to present in person. However, her power points were available).

Dr Callander demonstrated the economic benefits of tackling chronic disease at its source.

For demographic reasons, the population is becoming more vulnerable to higher health costs, through more health care and pension payments over a longer period. The Productivity Commission in a 2005 study graphed the changing age structure of the Australian population, showing a marked increase in the proportion of the population above 60 years old and a marked decrease below 20 years in 2000 compared with 1925. Yet many health economists focus on how to distribute the total budget "pie", without questioning the size of the pie, leaving that to political judgement.

The Productivity Commission in 2013 revealed that the proportion of the population claiming that they are "permanently unable to work" is rising: expressed in other words, the labour force participation rate of those under 65 is falling. Some 50% of males and 20% of females retire early because of ill health: *one million people out of the labour force (of only 11.8 million) due to ill health.* (Nine per cent in Queensland). This has big implications for health expenditure.

People aged between 45 and 64 who are out of the labour force because of chronic health conditions reduce GDP about $12 billion per annum ($2.7 billion in Queensland, 14% of its GDP). The national wage bill is less by about $18 billion, lost taxation is $2.1 billion and extra Centrelink payments are estimated at $1.54 billion. Any government concerned about productivity and labour force participation, as our national government claims to be, should be motivated to take remedial action.

For the individual, ill health is financially devastating. Average weekly income of this cohort if not in the labour force is only $218 per week, compared with $1170 per week if employed full-time. Median liquid assets for males at age 65 who retired early due to depression is estimated at $37,400, compared with $317,300 if employed full-time with no health conditions. More than 20% will skip medical care on the grounds of cost – as high as 44% for depression and other mental health conditions, compared with only 9% of those with no health conditions.

Policy should cease focusing on merely the size of the healthcare budget, but also consider the financial cost to individuals, the loss of human potential and quality of life and the inequality of outcomes across the socio-economic gradient.

Dr Wendy Laupu
Dr Laupu presented some insights from her doctoral thesis on the efficacy of mangosteen pericarp as an antipsychotic for the treatment of schizophrenia.

The first generation industrial drugs for schizophrenia date from the 1950s and were based on a sedative action. Dopamine was the target neurotransmitter. The second generation anti-psychotic drugs were released in the early 1990s and exhibit greater affinity for neurotransmitters other than dopamine, such as serotonin. However, their efficacy is limited.

Dr Laupu was impressed by data gathered from Christchurch, New Zealand, where endemic myxoedema (under-performing thyroids, with 32% of the population showing signs of goitre) had been counteracted by the addition of iodine to salt from 1926. This simple cause-and-effect train is analogous to the neurobiological basis of schizophrenia, with the first stage of psychosis being linked in some studies with deficiency of selenium.

However there are no accepted biomarkers for schizophrenia, so researchers must rely on clinical trials.

Normally, large molecules should not cross the blood-brain barrier. Dr Laupu found an active ingredient in mangosteen pericarp but its efficacy was very low, indicating that the blood-brain barrier was blocking the passage of molecules even if they could escape from the intestine. However, spray drying technology applied to pericarp material led to greatly increased activity. Clinical trials, with placebo trials as control, demonstrated a causal relationship between mangosteen pericarp and a reduction of symptoms. The precise reason why the polymer technology allowed the active molecule to cross the barrier is unclear.

Kurt Pudniks
Software engineer Kurt Pudniks introduced the A-rules software package, a powerful tool for sifting noise out of data to find the most powerful correlations. He cited a study in which a group of 20 experts identified 30 indicators of diabetes. A sophisticated analysis of the data reduced this to simply three.

Techniques are available to sort continuous variables into blocks which makes them more amenable to analysis. Advanced data mining algorithms can look through common linkages and zero in on interesting ones.

Mr Pudniks drew attention to the 'hackathon' exercise, www.govhack.org , an annual open data competition. Governments produce a terabyte of data per day most of which is or ought to be in the public domain. However Mr Pudniks deplored the decision by the Australian Taxation office to cease publishing input output tables for the Australian economy.

Plenary discussion
There are huge gains to be made by thoughtful policy changes in public policy in this field. There needs to be a large disinvestment in some forms of treatment and selective application of Medicare item numbers. At present, health care funding is a large black box with poor transparency. Actuarial statistics would be of great service.

The current model for developing new medicines is disserviceable and should be reconstructed. Current research by drug companies is systematically biased towards producing positive results, but public funding is declining: our society seems to accept the funding of this research by drug companies. The Public Health Network isn't funded to conduct research: it is a service delivery organisation.

Small institutions like university research institutes (and the Royal Society) have little clout in health policy compared with industry. The media should be made aware of the preconditions for good health so that the public can in due course be made aware of what is in their own interest.

It is cruel and inefficient to put frail elderly people on life-support. As consumers, we all want a 'good death', but families press for higher levels of care through motives of family responsibility.

There are many co-morbidities that can be addressed through healthy eating. But there are not a large number of randomised trials of good diet as the funding is simply not available. There is no PBS number/Medicare number for good food or exercise! No one is paying to develop healthy lifestyles.

While statins are relatively safe drugs, when nearly 50% of an elderly population is dosed on statins, something is wrong with primary health care.

The current funding model is comprehensively designed for acute care. Medicare removed the cost barriers for primary acute care through the network of general physicians. A completely new model is required for chronic ill-health. Treasury should be targeted with evidence of the economic benefit of investment in preventative health.

Childhood diets should be the focus of advocacy, based upon society's duty of care towards children. Fruit drinks and diet drinks are as bad as soft drinks in terms of their sugar content and physiological response.

The meeting concluded with broad consensus that of all policy initiatives, the most effective is likely to be an attack on childhood obesity, such as through a tax on sugary drinks or sugar in general. If the meeting is to advocate any innovation, this should be the one. Policy should make energy-dense, nutrient-poor food items more expensive. (However, it was suggested that 'tax' is an inappropriate word to use). The support of general practitioners is essential. Any public proposal should be accompanied by a proposal on how a the revenue from a sugar levy should be spent. A proposal for "Plain packaging for soft drinks" achieved general support.

The meeting endorsed a proposal that the Royal Society of Queensland should make submissions to the Queensland and Commonwealth Governments.

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1 September 2016