

**From theory to policy –
the implications of recent research findings on health inequality**

**Dr Harry Burns
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Overview

In this lecture Dr Burns reflects that recent trends show relative improvements in some Scottish health indices compared to other countries. However, health inequality remains an obstinate challenge in Scotland, with the greatest difficulties found largely in the Clydeside conurbation. The policy implications of this and the findings of recent research on the effects of stress on brain structure are considered.

Summary

Scotland and health inequality in comparison to other countries

Dr Burns began by showing that while life expectancy has improved overall in Scotland, its position relative to other similar European countries has declined. By the end of the 20th century Scotland had gone from about the middle of the ranking to second bottom, with only Portugal showing lower life expectancy in Western Europe. He suggested that a key driver of this trend, most visible from 1950 onwards, is the divergence in life expectancy between the most affluent and the most deprived groups in the population.

Taking this analysis further, he showed that premature death (0-64 years) from all causes is most heavily concentrated in the Clydeside conurbation, where about 30% of the Scottish population live. This suggests that whatever has caused the slowing of the rise in life expectancy seems to be associated with the decline of industry in the Clydeside region. This is true not only for life expectancy but also more specifically for healthy life expectancy. He also noted that over the past twenty years, men are narrowing the gap with women for healthy life expectancy.

Dr Burns described a range of mortality and morbidity patterns comparing Scotland, England, Wales and Northern Ireland. These showed that, while the

greatest differences in life expectancy between richest and poorest are to be found in Scotland, there is evidence to suggest that Scotland has narrowed the gap in some indices, for example for ischaemic heart disease, stroke and lung cancer mortality.

In some instances, for example inequalities in lung cancer mortality, Scotland is being overtaken by other countries, with Northern Ireland now having the largest lung cancer mortality gap between richest and poorest. This suggests that the 'Sick Man of Europe' title is not something which Scotland has to bear forever and that change is not only possible but is happening. Such changes are also evident for breast cancer mortality, where Scotland now does better than Denmark and is converging on the rest of Europe. This improvement does not hold for lung cancer mortality: currently there is a decline amongst men and an increase in women which can largely be explained by the former giving up smoking more successfully than the latter.

Infant mortality is declining in Scotland compared to the other home countries but has some way to go before it reaches Scandinavian levels. This is an important measure as it is a good proxy for socially determined ill health.

Dr Burns suggested that many of the long-standing patterns of illness that have been prevalent in Scotland are changing for the better, and some of the most overt health inequalities are also reducing. Dr Burns stated that this is largely due to improvements in treatment, supported by a more integrated NHS system.

Transition away from most common causes of death as drivers of inequality

Dr Burns then presented evidence to show that over the past twenty years or so trends show a swing away from major causes of death as drivers of inequality. He presented data to show that, among men aged 0 – 64 years, while cancers and respiratory diseases continue to be the main causes of death, they are not the major causes of relative inequalities in mortality. At the same time death rates from liver disease, suicide, the use of drugs and alcohol, and from assault are increasing, particularly among younger men.

So, while the most common causes of death are in decline, a new set are on the increase. For example, while chronic liver disease is declining in other European countries, it is on the increase for both men and women in Scotland linked to high levels of alcohol consumption. In common with other countries, there is also an increasing prevalence of obesity in men and women, associated with declining participation on exercise in all adult age groups.

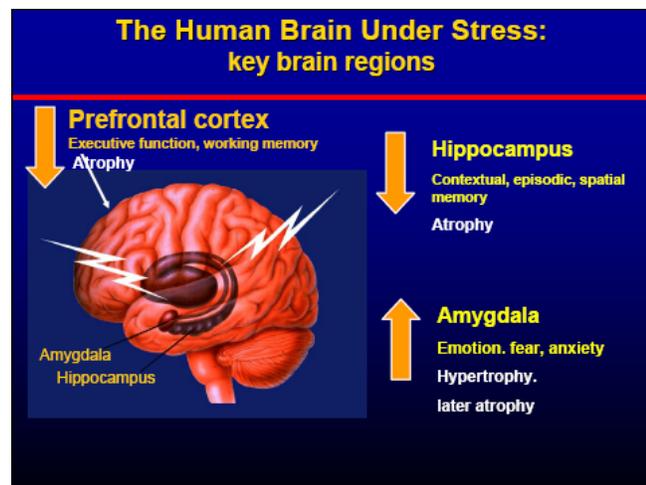
Social Circumstances and the negative effects of stress on health

In the penultimate section of his lecture, Dr Burns examined social circumstances and health more closely especially in relation to the impact of stress. When working as a surgeon, he saw more seriously ill people from deprived areas of the city than from the more affluent areas. However, on a death certificate, only the primary causes of death are recorded such as heart disease, blood clot or cancer, rather than the social circumstances such as poor housing, unemployment and poverty that may well have had a contributory effect.

Dr Burns described recent laboratory work in the USA, assessing the effect of stress and maternal deprivation on macaque monkeys, with whom we share 95% of our DNA. This research¹ showed that such stress, induced by varying the availability of food and the length of time a baby was separated from its mother, is greatest when the availability is varied, rather than when it is simply low.

Inconsistency of maternal contact increases the production of stress hormones in the monkey's brain, which in turn cause the structure of the brain to adversely alter.

The hippocampus, associated with long term and short term memory, and the prefrontal cortex, associated with executive function and decision-making, both shrink. The amygdala, associated with anger and aggression, grows.



Dr Burns showed Canadian data which suggest that the *human* brain whilst under stress exhibits a similar response. This was demonstrated by a study on six year old boys going to school for the first time. The hormonal response was greater in boys from less affluent backgrounds.

Dr Burns also showed that such a response in the laboratory monkeys led to obesity. This occurred because the hormonal response to uncertain food supply includes the suppression of appetite inhibitors, an appropriate response in such circumstances.

¹ Reported on by Professor Bruce McEwen in a previous Glasgow Centre for Population Health lecture

Similar American data indicate that hormone stress responses in cared for children increase the longer they stay in institutional settings.

In passing, Dr Burns referred to research in Glasgow on the relationship between stress response and wellbeing which involves a range of social and biological measurements - the pSoBid study². Whilst too early to draw definitive conclusions, the evidence generated shows similar tendencies to those described above.

Dr Burns used evidence from a range of sources on early brain, child development, and longitudinal social research to suggest that consistency in parenting was an important factor in setting the parameters for possible health states in later life. It appears that the more consistent early parenting is, the better the chances for health in later life. He also introduced research findings by Professor Liz Gould³ of Princeton University to suggest that damage to brain structure in the early years can be reversed in later life and new brain cells developed if life circumstances become more convivial.

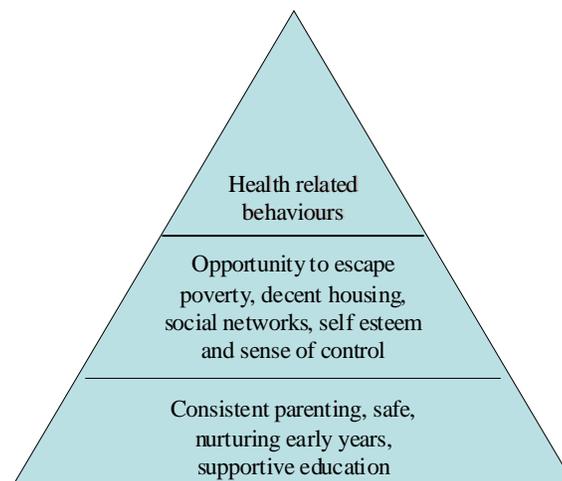
Concluding remarks

In concluding, Dr Burns suggested that over the past 20 years we have concentrated on health related behaviours as the vehicles by which health inequalities and premature death can be reduced. This approach may have been partially correct, but is effectively operating out of context.

Whilst it was important to work on these issues, the chances of health gain will be improved immeasurably if living and working conditions support the development of such activity.

He also suggested that a keystone on which the health enhancing properties of all this rested was consistent and nurturing parenting.

Finally Dr Burns briefly described his hopes for the recently launched Equally Well



² Details of which can be found on the GCPH website.

³ Also a speaker in a previous GCPH seminar.

programme to investigate such issues in a number of test sites across Scotland. The programme has variety in its geographical locations and the issues each area has chosen as their focus. The hope that he expressed for the programme is that it would become a learning network which demonstrates both *what* might be done to tackle the drivers of inequality in health and also *how* that might be most effectively achieved.

The views expressed in this paper are those of the speaker and do not necessarily reflect the views of the Glasgow Centre for Population Health.

Summary prepared by the Glasgow Centre for Population Health.