

assessment relative to agreed targets. If, as hoped, indicators for mental health are included within the sustainable development goals for 2015–2030, these would provide a valuable cross-country framework to encourage data collection. At the inception stage, national, state and district level MHIS should be routinely monitored and evaluated. It is pertinent to emphasise both the process of MHIS implementation (such as availability of data collection forms) as well as outcomes (such as effective coverage) during evaluation. The need for convergent actions from planners, implementers and researchers towards prioritising monitoring and evaluation of mental health data systems cannot be over-emphasised.

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Pandora searches the world literature for evidence, news and other sources on matters of interest (doesn't shy away from controversy) to bring to the reader. She welcomes comments

### **Beware! Dim light can make you a dimwit!**

We all know that the short days in wintertime can make us depressed, and that extending the daylight period by daily exposure to bright light can restore normal mood. We also know that bright lighting improves cognitive performance in the young and in adults, as well as in the early stages of dementia. We didn't know, however, at least until now, how this happens.

Grass rats (who experience similar diurnal variations to humans) placed in dim light (50 lux) showed impaired spatial memory after 4 weeks, compared with those placed in bright light (1000 lux). The deficit was remedied when the rats were placed in bright lighting conditions for another 4 weeks. Under the dim lighting conditions, brain-derived neurotrophin – which is important in brain neuroplasticity – was decreased in the hippocampus, and there were associated neuronal changes, with a reduction in dendritic spine

and suggestions (via [ip@rcpsych.ac.uk](mailto:ip@rcpsych.ac.uk))

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density. These changes also improved after 4 weeks of the rats being transferred to bright lighting.

The lesson is not to spend too much time in dimly lit environments, romantic though these may seem!

Soler J. E., Robison A. J., Núñez A. A., et al (2018) Light modulates hippocampal male and spatial learning in a diurnal rodent species: a study using male Nile grass rat (*Arvicanthis niloticus*). *Hippocampus*, 28, 189–200.

### ***New avenues in the treatment of brain disorders? Exciting findings***

Arc is a protein known to be vital to the brain's ability to store new memories. What shocked researchers was the finding that this protein is formed and released by cells to reach neighbouring cells, inside extracellular vesicles, in a form similar to a viral capsid (the shell that contains a virus's genetic information), mirroring not only their physical structure but also their behaviour and other properties. Arc capsids contain the Arc gene's mRNA. The more active the neurons, the more of the Arc capsid-containing vesicles are released.

The researchers suggest that the Arc capsids act like viruses in delivering mRNA from one cell to another. They believe that they could use Arc capsids to deliver gene therapy. Viruses are currently used to deliver genetic material, but they risk being attacked by the human immune system. Using Arc capsids instead of viruses for genetic engineering and gene therapy will not activate the immune system, as the Arc protein is innate to the human body.

Pastuzyn E. D., Day C. E., Kearns R. B., et al (2018) The neuronal gene Arc encodes a repurposed retrotransposon gag protein that mediates intercellular RNA transfer. *Cell*, 172(1–2), 275–288.

### ***Enteric pathogens reach our brains via the vagus nerve and cause Parkinson's disease***

The gastrointestinal tract and its microbiome and pathogens have been increasingly linked to neuropsychiatric conditions. There are various theories as to the pathophysiological basis of this. In this study, the vagus nerve is seen as the conduit of pathogens from the gut to the brain.

Incredible as this may seem, Danish researchers have found evidence that Parkinson's disease begins in the gut. Using the Danish registry, they identified 15 000 patients who had undergone vagotomy between 1970 and 1995 (a procedure used at the time in the treatment of peptic ulcers) and compared them with a matched general population cohort who had not undergone vagotomy. They found those who had undergone vagotomy to be protected from Parkinson's disease, with the risk for this condition halved after 20 years.

Food for thought ... and movement?

Svensson E., Horváth-Puhó E., Thomsen R. W., et al (2015) Vagotomy and subsequent risk of Parkinson's disease. *Annals of Neurology*, 78(4), 522–529.

### ***Play it again Sam!***

Are you one of those people who have a favourite song that they like to hear again and again? If so, have you ever wondered what is it that draws you back to it?

Investigators at the University of Michigan found that certain features of a song, such as melody, beat/rhythm and lyrics, were the most important factors. Interestingly, the beat/rhythm was most important for those whose favourite song made them happy! Those whose favourite song made them feel bittersweet had a deeper connection to that song than those whose favourite song evoked other feelings. These patterns were not dependent on whether the listener was musically trained or not.

The investigators also found that the more they listened to the song, the more of it they could hear internally. This affection for a favourite song does not wane, unlike that for other songs such as those of the hit parade.

Listen to your favourite song at your heart's content. Enjoy it!

Conrad F., Corey J., Goldstein S., et al (2018) Extreme re-listening: songs people love ... and continue to love. *Psychology of Music* 2018, DOI: 10.1177/0305735617751050.

### ***International Women's Day***

In case it has passed you by, 8 March was International Women's Day, a day to take stock of progress made towards gender parity and asserting women's human rights across the globe. In the UK, the year 2018 marks the 100th anniversary of women getting the right to vote. This year is also the 20th anniversary of the Beijing Declaration and Platform of Action, which laid the pathway for gender equality and women's empowerment.

Governments have made some efforts to implement the commitments made, and there has been some progress made in reducing maternal mortality and, more so, infant mortality and morbidity, particularly after the launch of the United Nations Secretary General's *Global Strategy for Women's and Children's Health* in 2010. However, this is far from adequate progress. According to Dr M. Temmerman, Director of the World Health Organization's Department of Reproductive Health and Research, 'despite progress, societies are still failing women in relation to health, most acutely in poor countries and among the poorest women in all countries. Discrimination on the basis of their sex leads to health disadvantages for women. The vision of gender equality in health remains an unfinished agenda'.

According to the World Health Organization's 1998 *World Health Report*, 'Women's health is inextricably linked to their status in society. It benefits from equality, and suffers from discrimination. Today, the status and well-being of countless millions of women worldwide remain tragically low' (p. 6).

### ***Blame society if men are better than women at maths!***

For many years, nature and nurture were blamed for differences in maths performance between men and women. However, now that the gender gap is close to zero in high-income countries (although women are still heavily underrepresented among math high performers), is nurture still the main culprit for these gender differences?

The authors of a recent publication in *Science* have explored other possible avenues leading to gender inequalities in maths and science. Although studies in the 1990s and 2000s pointed the finger at gender inequalities of cultural origin, the authors claim that more recent studies found this link to be weak.

They used a different approach, using data from the Programme of International Student Assessment (PISA) from 35 countries belonging to the Organisation for Economic Co-operation and Development (OECD). They analysed five successive waves of PISA, carried out every 3 years in 70 countries, assessing the performance of 15-year-olds in maths, reading and science. They related gender gaps in PISA performance to measures of societal inequalities in each country; these were not directly related to gender, but reflected (a) general socioeconomic, including income and cultural, inequalities; and (b) educational inequalities, including those in performance and learning opportunities.

They found that the relationship between the gender gap in maths performance and societal inequality is larger and more robust than other possibilities considered so far. They conclude that 'gender equality may not be only a matter of norms and stereotypes'. They suggest general policies that are more inclusive and less vertically

stratified, and more standardised educational systems that may have a more positive effect on girls' performance.

Breda T., Jouini E., Napp C. Societal inequalities amplify gender gaps in maths. Egalitarian countries cultivate high performing girls. *Science* 2018; 359(6381): 1219–1220.

### ***Natural disasters and human despair: are we doing enough?***

Puerto Ricans have been committing suicide nearly every day after hurricane Maria', according to a report by Maria Perez. A report by the Commission of Suicide Prevention and Department of Health states that there have been, as of November 2017, 227 deaths by suicide.

Hurricane Maria brought destruction and a high death toll in Puerto Rico last year. The fear of what next June, the hurricane time, might bring creates more anxiety. There has been a dramatic rise in the number of patients attending the mental health services, according to the head of the Ponce Health Sciences University of Puerto Rico. However, as always, those living in the poverty stricken parts of the country suffer the most, and they are the ones who have the least help or none.

Alfredo Carrasquillo, the executive leadership coach and organisational consultant at the Universidad del Sagrado Corazón in San Juan, is scathing of the local mental health services, as well as the lack of help from the US government. He states: 'the healthcare system, especially for poor people, is a limited amount of days. They are given medication and are sent home'.

Perez M. (2018) Puerto Ricans have been committing suicide nearly every day after hurricane Maria, a new report shows. *Newsweek*, 13 January.