Mental health and global well-being

PETER ANDERSON1,2* and EVA JANÉ-LLOPIS3
1 Substance Use, Policy and Practice, Institute of Health and Society, Newcastle University, UK
2 Alcohol and Health, Faculty of Health, Medicine and Life Sciences, Maastricht University, The Netherlands
3 Chronic Diseases and Well-Being, World Economic Forum, Geneva, Switzerland
*Corresponding author. Institute of Health and Society, Medical Faculty, Baddiley-Clark Building, Richardson Road, Newcastle upon Tyne NE2 4AX, UK. E-mail: peteranderson.mail@gmail.com.

SUMMARY
A range of evidence-based, cost-effective interventions can be implemented in parenting, at schools, at the workplace and in older age to promote mental health and well-being. Such programmes need to be supplemented with actions to build mental health capital and promote resilience to manage and cope with the global risks that face humankind over the coming years. Actions need to connect mental and physical health and individuals need to be connected through health-promoting social networks; living environments need to be designed to support mental health and well-being; well-being indicators that include material living conditions, quality of life and sustainability can help drive healthy public policy. There is an urgent need to invest in skills training in decision-making, social interactions, building trust and cooperative behaviour that support the family of humanity as a whole as it faces the unprecedented stressors resulting from climate change.

Key words: mental health; well-being; resilience

INTRODUCTION
We began this supplement by noting that mental and behavioural disorders account for about one-third of the world’s disability due to all ill-health amongst adults, and that unipolar depressive disorders are set to become the world’s number one cause of ill-health and premature death in 2030, affecting high- and low-income countries alike (Anderson et al., 2011). This burden of impaired mental health calls for extensive and urgent action to promote mental health and to prevent mental disorders. The papers in this supplement have described a range of evidence-based, cost-effective interventions that can be implemented in parenting, at schools, at the workplace and in older age, that promote mental health and well-being, reduce mental disorders and lead to improved productivity (Czabała et al., 2011; Forsman and Wahlbeck, 2011; McDaid and Park, 2011; Stewart-Brown and Schrader-McMillan, 2011; Weare and Hind, 2011). Finally, a sixth paper highlighted the importance of commissioning high-quality evaluations and the importance of policy makers in supporting evidence-based implementation (Jané-Llopis et al., 2011).

However, in addition to such evidence-based programmes, a lot more needs to be done if we are really going to have an impact in promoting mental health and well-being and in reducing the burden due to impaired mental health. This becomes crucial given the need to promote resilience to manage and cope with the global risks and stressors that face humankind over the coming years.

In this concluding paper we touch on a number of additional issues, including, for individuals, the connectedness between mental and physical health; the importance of environments
in which we live to support mental health and well-being; the importance of well-being indicators as drivers of change of supportive public policy; and the mental health imperative resulting from the global risk landscape. We conclude by considering why there is such a mismatch between what needs to be done and what is being done, and what can we do next.

**CONNECTEDNESS BETWEEN MENTAL AND PHYSICAL HEALTH**

Although some 28% of the global burden of non-communicable disease is attributed to mental and behavioural disorders, the full burden of mental disorders is likely to be underestimated because of inadequate appreciation of the connectedness between impaired mental health and other health conditions (Prince *et al.*, 2007). Because these interactions are protean at the individual level, there can be no health without mental health. Impaired mental health increases the risk for communicable and non-communicable diseases, and contributes to unintentional and intentional injuries. Conversely, many health conditions increase the risk for impaired mental health. Thus, to increase its reach and impact, mental health promotion needs to be integrated into prevention and promotion programmes related to communicable diseases, including HIV, tuberculosis and malaria, intentional and unintentional injuries, pregnancy and child care, and non-communicable diseases, including cardiovascular and respiratory disorders and cancers (Prince *et al.*, 2007).

Connectedness also works through social networks, which have a major impact on individual behaviours and outcomes. Data from the Framingham Heart Study have demonstrated that social networks determine much health-related behaviour, including alcohol (Rosenquist *et al.*, 2010) and tobacco use (Christakis and Fowler, 2008). Social networks can also worsen loneliness (Cacioppo *et al.*, 2009) and depression (Rosenquist *et al.*, 2011).

Loneliness, for example, occurs in clusters, extends up to three degrees of separation, is disproportionately represented at the periphery of social networks and spreads through a contagious process (Cacioppo *et al.*, 2009). Comparison of the proportion of a person’s friends and family who are lonely at one assessment, and the number of days per week that person feels lonely at the next future assessment, finds that an extra quarter day of loneliness is added per week to the average person who is surrounded by other lonely people compared with those who are not connected to anyone who is lonely. This suggests that efforts to reduce loneliness may benefit by actively targeting the people in the periphery to help repair their social networks and to create a protective barrier against loneliness that can keep the whole network from unravelling.

Similarly, depression spreads through a contagious process (Rosenquist *et al.*, 2011). There is a powerful relationship between the fraction of a person’s friends and family who are depressed at one assessment and the likelihood they will be depressed at the next future assessment. The determinant is not how many contacts a person has or how central a person is, but whether a large or small fraction of those contacts is also depressed. The relationship is significant and nearly doubles the likelihood of depression for the average person who is surrounded by other depressed people compared with those who are not connected to anyone who is depressed.

We should not forget that there are no dichotomies between people, for example, with and without depression, impaired mental health, hypertension, alcohol use disorders and so on (Rose, 1992). Rather, what society calls the ‘deviants’ are simply the tail of the population’s own distribution, and such social distributions shift as a whole, reflecting the coherent nature of society. Inequalities within societies are one of the biggest drivers of such risk factors and outcomes (Wilkinson and Pickett, 2009). Health and social problems and impaired mental health are more prevalent in more unequal societies.

**THE IMPORTANCE OF THE ENVIRONMENT IN WHICH WE LIVE**

Hippocrates, writing 2500 years ago, advised anyone coming to a new city to enquire whether it was likely to be a healthy or unhealthy place to live, depending on its geography and the behaviour of its inhabitants [e.g. ‘whether they are fond of excessive drinking’ (Hippocrates, translated by Lloyd 1978)]. He continued, ‘as a general rule, the constitutions and the habits of a people follow the
nature of the land where they live’. In his poem, Peter Bell the Third, Shelley (reprinted 2009) wrote, ‘Hell is a city much like London/A populous and a smoky city/There are all sorts of people undone/And there is little or no fun done/Small justice shown, and still less pity’.

Although people who live in cities are, on average, wealthier and receive improved sanitation, nutrition and health care, they do have increased risk for chronic health disorders, a more demanding and stressful social environment and greater social disparities. Meta-analyses show that current city dwellers have a substantially increased risk for anxiety disorders (by 21%) and mood disorders (by 39%) (Peen et al., 2010). Longitudinal studies suggest that the impact of urban life on impaired mental health is causal and not mediated by other epidemiological variables, and might be due to increased social evaluative threat, including social defeat and chronic social stress.

A recent study in Germany, using functional magnetic resonance imaging, found that urban upbringing and city living had independent impacts on processing of social evaluative stress (Lederbogen et al., 2011). The study’s participants lived or had lived in locations ranging from rural areas to large cities. The authors measured regional brain activation while participants performed a social-stress test which resulted in significant activity in brain structures known to be involved in emotion and stress. Of the activated brain regions, two were of particular interest: activation in the amygdala correlated with the size of the city in which an individual currently resided, and activation of the perigenual anterior cingulate cortex (pACC) correlated with how long a participant had lived in a large city during their childhood. Urban upbringing also affected the strength of the functional coupling between the amygdala and the pACC: those who had spent more time growing up in large cities had reduced functional connectivity between these two regions. Social threat, lack of control and subordination are all likely candidates for mediating the stressful effects of city life, and probably account for much of the individual differences seen.

Much can be done to counteract the impact of the living environment on mental well-being, including utilizing social networks to promote happiness, as well as changing the design of the living environment to increase other actions that promote mental health, such as physical activity. People who are surrounded by many happy people and those who are central in social networks are more likely to become happy in the future (Fowler and Chistakis, 2008). It seems that clusters of happiness result from the spread of happiness and not just a tendency for people to associate with similar individuals. A friend who lives within 1.6 km and who becomes happy increases the probability that a person is happy by 25%.

There are many strategies to promote physical activity in urban environments (Saelens et al., 2003; Pucher et al., 2009; Forsyth and Krizek, 2011), a key protective factor for mental health and well-being (McAuley et al., 2011). For example, strategies to promote cycling include combinations of infrastructure, community design, pricing and enforcement of traffic regulations (Pucher and Buehler, 2008; Yang et al., 2010). Interventions to promote walking tailored to people’s needs, targeted at the most sedentary or at those most motivated to change, and delivered either at the level of the individual (brief advice, supported use of pedometers, telecommunications) or household (individualized marketing) or through groups, encouraged people to walk more, with the most successful interventions increasing walking among targeted participants by up to 30–60 min a week on average (Ogilvie et al., 2007). Employers also have a role to play. Subsidizing employees who choose not to commute to work by car has been found to increase the proportion of employees who walk or cycle to work. California law requires many employers to offer commuters the option to choose cash in lieu of any parking subsidy offered. An analysis of eight firms that complied with the cash-out required found the number of employees who walked or biked to work increased by 39% (Shoup, 1997). Carbon dioxide emissions from commuting fell by 367 kg per employee per year. Government income tax revenues increased by $65 per employee per year because many commuters voluntarily traded tax-exempt parking subsidies for taxable cash.

THE IMPORTANCE OF WELL-BEING INDICATORS AS DRIVERS OF CHANGE

One way to help drive change for better mental health and well-being at the
jurisdictional level, country or municipal, is to broaden the measurement tools that governments use to monitor their progress, recognizing that absolute material wealth is not necessarily the major determinant of well-being (Andreou, 2010; Diener et al., 2010). Thus, sole reliance on gross domestic product (GDP) as a country’s measure of performance is inappropriate (Hall et al., 2010). For example, the OECD Better Life Initiative includes measures of housing, income and wealth, jobs and earnings, social connections, education and skills, environmental quality, civic engagement and governance, health status, subjective well-being, personal security and work life balance in its assessment of countries’ progress and well-being (OECD, 2011). The framework distinguishes between current material living conditions and quality of life, on the one hand, and the conditions required to ensure their sustainability over time, on the other (Figure 1). Material living conditions (or, economic well-being) determine people’s consumption possibilities and their command over resources. While this is shaped by GDP, the latter also includes activities that do not contribute to people’s well-being (e.g. activities aimed at offsetting some of the negative consequences of economic development) while it excludes non-market activities that expand people’s consumption possibilities. Quality of life, defined as the set of non-monetary attributes of individuals, shapes their opportunities and life chances, and has intrinsic value under different cultures and contexts. And, sustainability of the socio-economic and natural systems where people live and work is critical for well-being to last over time. Sustainability depends on how current human activities impact on the stocks of different types of capital (natural, economic, human and social). However, suitable indicators for describing the evolution of these stocks are still lacking in many fields (Dasgupta, 2010; OECD, 2011).

Fig. 1: Framework for OECD indicators (OECD, 2011).
THE MENTAL HEALTH IMPERATIVE RESULTING FROM THE GLOBAL RISK LANDSCAPE

Each year, the World Economic Forum publishes its global risks perception report. The 2011 report places climate change, which is, arguably, the greatest threat humankind currently faces (King, 2011) at the top of the global risks landscape along with other human-made crises, fiscal, chronic diseases and global governance failures (Figure 2).

Much has been written about the impacts of climate change on health and mental health and well-being (Fritze et al., 2008; Costello et al., 2009, 2011; Doherty and Clayton, 2011) and on the co-benefits of climate mitigation and health policies (Haines et al., 2009). For example, moves towards lower-carbon-emission motor vehicles, and increased active travel with less use of motor vehicles in London and Delhi improve health by increasing physical activity (thus reducing disability adjusted life years) at the same time as reducing CO₂ emissions (Woodcock 2011).
et al., 2009). There are also co-benefits to mental health and well-being and biodiversity from increased green spaces (Bird, 2007). The behavioural sciences have also informed efforts to mitigate or limit climate change, although, as with other responses to climate change, responses are influenced by both individual and contextual factors (Gifford, 2011; Sternm, 2011). Much has also been written about policy drivers of climate change adaptation (Biesbroek et al., 2010; Tompkins et al., 2010), and social and ecological resilience (Chuku and Okoye, 2009; Turner, 2010; Bunch et al., 2011).

However, much less has been written about the importance of mental health capital and resilience at the individual and community levels to adapt to the stressors imposed by climate change (Doherty and Clayton, 2011; Reser and Swim, 2011) and to prevent the social and community impacts of climate change that are likely to involve violence (Anderson and DeLisi, 2011) and intergroup conflict (Gilman et al., 2007) subsequent to displacement and relocation (Agyeman et al., 2009), socio-economic disparities (Doherty and Clayton, 2011) and decreased access to supportive and thriving ecosystems (Younger et al., 2008).

Much is now known about the neuroscience of emotional processing and resilience (Kim-Cohen and Gold, 2009) and factors that can moderate competence and resilience in development to avoid environmentally triggered depression and violence (Masten and Obradovic, 2006). Although genotypes can predispose to increased risk of depression (Caspi et al., 2003) and violence (Caspi et al., 2002), environmental interventions can reduce risk and promote mental health. For example, having a supportive relationship with an adult protects maltreated children from developing depression, even among genetically at-risk children (Kaufman et al., 2006). This suggests that interventions can be done to strengthen mental health capital, mitigating stress due to climate change and hopefully helping to prevent the negative social and community responses to climate change.

WHY IS THERE SUCH A MISMATCH BETWEEN WHAT NEEDS TO BE DONE AND WHAT IS BEING DONE

The question is why there is such a mismatch between what needs to be done and what is being done in promoting mental health and well-being. This is related to the environment in which our brains evolved. Our brains are optimized for finding food and rearing children in the African savannah (Grine and Fleagle, 2009; Lieberman, 2011). Our brains include a threat detection system that is exquisitely sensitive to the kinds of threats that our ancestors faced, but that is remarkably insensitive to the odds and consequences of the threats that we face today (Bar, 2009; Llinas and Roy, 2009). For example, the human brain devotes a great deal of time and space to processing information about other people, and leading us to be especially concerned when the threats other human agents produce are, to our dignity, values and honour (Gilbert and Wilson, 2009; Mitchell, 2009).

One solution to the mismatch is to frame problems in ways that appeal to human nature (Gardiner, 2011). For example, a simple study of the reuse of towels in hotel rooms found that towel reuse increased from 35% when a traditional message was used, ‘help save the environment by reusing your towels’ to 44%, when a more moral-based normative message was used, ‘75% of the guests who stayed in this room participated in our new resource savings program by using their towels more than once’ (Goldstein et al., 2008). Another solution to the mismatch is to try change the way people think. People are capable of thinking rationally about odds and consequences, and it is not hard to teach them. Research shows that a simple 30 min lesson can dramatically improve people’s decision-making that remains valid in new domains 1 month later (Larrick et al., 1990). We are developing a much better understanding of the neurobiological bases of human social interaction (Frith and Frith, 2010) and of communication and consensus decision-making and collective behaviour amongst humans (Dyer et al., 2009). These can be taught to increase reputation and trust and improve collective and cooperative behaviours. Cooperative behaviours, themselves, can be cascaded in human social networks (Fowler and Christakis, 2010). Experiments have shown that in both an ordinary public goods game and in a public goods game with punishment, focal individuals are influenced by fellow group members’ cooperative behaviour in future interactions with other individuals who were not a party to the initial interaction. Furthermore, this influence persists...
for multiple periods and spreads up to three degrees of separation (from person to person to person). The results suggest that each additional contribution a subject makes to the public good in the first period is tripled over the course of the experiment by other subjects who are directly or indirectly influenced to contribute more as a consequence.

What can we do next? As Stewart-Brown and Schrader-McMillan (Stewart-Brown and Schrader-McMillan, 2011), Weare and Hind (Weare and Hind, 2011) and McDaid and Park (McDaid and Park, 2011) have indicated, we need to expand our investments in supporting parents and in convening high-quality health-promoting schools that build mental health capital and promote resilience as youth move into adulthood. This should include skills training in decision-making, social interactions, building trust and cooperative behaviour for all of humanity. Building on the reviews of Czabała et al. (Czabała et al., 2011) and Forsman and Wahlbeck (Forsman and Wahlbeck, 2011), we need to design living and working environments that support mental health and well-being and that help preserve the mental health capital and cognitive functions of the middle age brain as it ages. We need to drive all of this with evidence (Jané-Llopis et al., 2011) and better indicators that reflect societal well-being. Finally, we should do our utmost to build resilience and adaptation strategies that support the family of humanity as a whole as it faces unprecedented stressors resulting from climate change.

REFERENCES


Fowler, J. H. and Christakis, N. A. (2010) Cooperative be-


Pucher, J., Dill, J. and Handy, S. (2009) Infrastructure, programs, and policies to increase bicycling: an
Preventive Medicine, 50 (Suppl 1), 106–125.


