

Complementary and Alternative Medicine - CAM: The research priorities for its use in citizens' health and healthcare systems reform

Introduction

This submission is presented on behalf of EUROCAM a European stakeholder group consisting of:

- CAMDOC, an alliance of European umbrella organisations of national CAM doctors' associations
- EFCAM, a European federation of CAM modalities and national CAM practitioners' organisations
- EFPAM - European Federation of Patient Associations in Anthroposophic Medicine.
- EFHPA - European Federation of Homeopathic Patients' Associations

Our focus is on citizen health and health research so this submission deals with the potential contribution of Complementary and Alternative Medicine (CAM) to citizens' health and to healthcare systems in Europe and to the research priorities pertaining to that.

For CAM professionals there is an obvious synergy between the underlying values and the practice objectives of the various CAM modalities and the three strategic objectives of the current EU health strategy:

- fostering good health in an ageing Europe,
- protecting citizens from health threats
- supporting dynamic health systems and new technologies.

In our briefing document of March 18th 2009, CAM Community Policy and the Citizen, we state:

Our healthcare system should shift its focus from a mainly treatment-oriented framework of public health to a more prevention-centred society in which healthy lifestyles are promoted and sustained.

CAM's twin objectives of maintaining health and of treating sick patients in an individualised way where the focus is on salutogenesis¹, and sustainable and safe treatment of illness, are inherently geared to fostering good health, strengthening health for resistance to health threats and to sustainable, safer and more cost-effective health delivery systems. What underlies most if not all of the CAM approaches to health and its care is that the human being is understood to be a complex whole system of integrated sub-systems that functions on the principle of homeostasis, is normally self-maintaining and can be treated in way as to support that homeostatic function.

It is estimated that 150-200 million EU citizens use CAM annually. Surveys on reasons for use indicate that the major reasons are health maintenance, prevention of illness and treatment for a range of chronic illnesses. A body of accumulating research evidence shows that treatment is safe, non-invasive and contributes greatly to health literacy and self-responsibility

¹ an approach focusing on factors that support human health and well-being

for health.

In the order of 300,000-400,000 CAM professionals including doctors and non-medically trained practitioners practise a range of CAM modalities in the EU. Current delivery of CAM is predominantly through private practice and access is difficult and inequitable for millions of citizens who cannot afford to pay privately.

Surveys clearly show that it is in early middle age that citizens begin to increasingly use CAM when awareness about the need to stay healthy and the onset of chronic illness tend to coincide. Surveys report high levels of user satisfaction and a range of benefits that go beyond the simple treatment of specific symptoms to reported improvements in vitality and well-being together with the promotion of health literacy and a greater self-responsibility for health that motivates lifestyle change.

To date the synergy referred to above has not lead to practical effective measures involving the use of CAM, despite the potential suggested in the Health Programme itself. Neither are we aware of any partnerships in health programme projects or FP7 projects that have included CAM to any significant extent, CAMbrella notwithstanding. **A major reason for this situation is the lack of sufficient and appropriate research.**

Current medical research

The knowledge of present-day medicine has been obtained by identifying and studying diseases as entities in themselves and the consequent effect of therapeutic methods upon them. The principal aim of medical research is to determine which factors cause a particular disease. Ideally, it is about the mechanism by which the causal factors affecting the body are identified so that methods can be developed by which the influence of the causal factors is prevented or lessened, or their effects on the body reduced. The implicit assumption underlying this approach is that health is the absence of deviations and complaints and that biochemical processes in the physical body primarily determine the state of health. Another assumption is that the occurrence of a disease is determined by a causal factor and that the elimination of the disease is achieved by a certain therapy if one is available. Ideally, all ‘causal factors’ of diseases, or, put more generally, all ‘unhealthy factors’ would be eradicated from the world.

The emergence of complexity science and systems biology

The paradigm of science for the last several hundred years has been one of reductionism; that is, further study of the parts of systems will lead to deeper understanding and predictability. Indeed, this tradition has led to great advances in knowledge. However, while systems can be broken down into parts that are interesting in and of themselves, the real power lies in understanding the way the parts come together and are ordered and interconnected to fulfil some purpose.

Complexity science represents a growing body of interdisciplinary knowledge about the structure, behaviour and dynamics of change in complex adaptive systems. It offers a conceptual framework that reflects reality better. In the real world, small inputs can have large effects and processes are dynamic. Complexity science has numerous applications, including science, society, economics and not least, health and its care. Articles on complexity science

are increasingly being published in mainstream medical journals (Goldberger, 1996; Wilson, 2001; Bell, 2002; Longtin, 2005; Federoff & Gostin, 2009).

Systems biology, which is complexity science applied to biological systems, seeks to understand the workings of biological systems ‘as a whole’, placing a greater emphasis on the interactions between components, and the consequences of such interactions, than on the components themselves. In this context, systems biology views human beings as self-regulating, self-organising complex living systems, composed of and operating within multiple interacting and self-adjusting systems, including biochemical, cellular, physiological, psychological, and social systems. Complex living systems have an inherent tendency to keep functioning at their optimum – to be healthy, in fact. Life is self-maintaining and self-renewing, and what is stable is the pattern, not the substance. Cells, molecules and atoms are taken in and excreted in a constant exchange with the environment.

Systemic model of health and disease

Systems biology has contributed to the development of a new, integrated concept of disease and therapeutics (Coffrey, 1998). Health is not merely the absence of disease or infirmity, but the ability of a system, e.g. cell, organism, family, society to respond adaptively to a wide range of environmental challenges, e.g. physical, chemical, infectious, psychological, etc. (Brody & Sobel, 1979). Health can only be maintained – or re-established – through a systemic approach that accepts environmental unpredictability being constantly adapted to by intrinsic systemic homeostasis and builds on subtle emergent forces within the overall system.

Systems biology suggests that illness (and health) results from complex, dynamic, and unique interactions between different components of the overall system. Disease is a condition that arises in a living organism, where homeostasis fails and a malfunction develops that impairs the normal operation of the organism. It is a failure of adaptive response, a breakdown or imbalance somewhere in the systems, subsystems, and meta-systems that comprise an otherwise healthy person. Symptoms are not the disease as such, but the evidence that such a systemic breakdown has occurred. The cause of the disorder is not so much the external or physical challenge to the system but the system’s inability to overcome the challenge, to adapt and restore. In short, ‘diseases’ are not objects with their own separate existence but symptomatic reflections of the malfunctions of a system, breakdowns in self-organisation.

Ways of dealing with ‘disease’

As far as communicable diseases are concerned, current research is focused on how to deal with invading, increasingly resistant bacteria or viruses by inventing ever more powerful antibiotics. A new dimension of medicine opens up if the host and the host’s ability to repel invaders are considered. The preoccupation with destruction of microbes has displaced any interest in optimising the natural immunity of the patient. Variations in natural immunity, even when it comes to serious diseases, remain unexplained and unexploited. Most people would know of someone who rarely succumbs to any infection. Such a person can go for 10 or 20 years without even catching a cold even though his/her associates or friends may repeatedly catch infections. And even in a flu epidemic, most people remain unaffected. In other words, microbes are a necessary but certainly not a sufficient cause for communicable disease. When strong, the immune system keeps people healthy in spite of their constant

exposure to germs that permeate everyone's environment. Good health comes from the ability of the immune system to deal with micro-organisms.

Conventional medicine has had its greatest success in the treatment of infectious diseases. In line with this approach to infectious diseases – i.e. micro-organisms attacking human beings are the cause of disease and have to be annihilated – conventional medicine has come to see all diseases as separate entities that are threatening and have the power to 'attack' the organism, e.g. cancer or arthritis can be 'aggressive'. However, this approach is less appropriate in chronic disease where the disease, such as arthritis arises as a systemic disturbance within the patient. This understanding helps to account for conventional medicine's low success rate in tackling chronic disease. In these kinds of disease there is nothing to treat except the patient, for the disease is entirely a condition of the patient. Hence anti-inflammatory medication, designed to be 'anti' inflammation, is attacking the self-regulatory function of the organism itself. From a systems perspective, the damaged joints are seen as a result of dysfunction of the system. It is the system that is failing to maintain the joints, and this leads to damage. The changes in the joints are the result of a systemic problem; the term arthritis just describes a condition of deterioration of the joints, not a separate entity. In fact a phrase such as 'arthritic syndrome' is more accurate as it refers to an overall state of malfunction.

The emerging science of health, resilience and salutogenesis

To date, huge amounts of research have been focused on studying diseases and the consequent effect of therapeutic methods upon them. Comparable progress in terms of understanding the phenomenon of 'health' has lagged behind. This is surprising, considering the importance of health in our present society. Good health, both physically and mentally, may lead to, among others, less absenteeism and a higher productivity. Therefore, currently more and more attention is paid to understanding how a state of health can be achieved and maintained and how, via prevention and intervention, we can attain better health.

To explain why people manage to stay perfectly healthy, despite experiencing stressful situations, the concept of salutogenesis is used. This salutogenic model includes two key elements: i) an orientation towards problem solving; and ii) a capacity to utilize the resources available (Lindström & Eriksson, 2005). The concept can be described as a coping strategy by the body (possibly in response to a specific stressor), in which interaction between the psyche, the central nervous system and the immune system together influence the physiological response to a certain challenge, with the aim of maintaining general physical and mental health. A factor analogous to salutogenesis is resilience, described by Cicchette and Blender (2006) as "a dynamic developmental process that has been operationalized as an individual's attainment of positive adaptation and competent functioning despite having experienced chronic stress or detrimental circumstances, or following exposure to prolonged or severe trauma".

The dynamic component is essential for describing health, showing that health lies on a continuum and is far from being static. As being a dynamic phenomenon, health can be seen as the successful dealing with disturbances. Health means a well-tuned organism, maintaining itself as a fully operational human being. Health is a successful self-preservation and self-protection, an active and continually evolving activity of the organism.

CAM approach consistent with modern science

In a workshop with experts from the fields of CAM research and complexity science, sponsored by the USA National Center for Complementary and Alternative Medicine (NCCAM) ways in which complexity science can be applied to CAM research were discussed and examined (Ahn et al., 2010). Some excerpts from the workshop summary that are relevant for the paper in hand follow here:

“Many CAM therapies are rooted in a worldview most consistent with complexity and systems theory. The human body is viewed holistically and considered dynamic and complex; the mind, body, and spirit are inextricably linked; and the interactions among the organs and individuals are as important as the components themselves. This worldview has led to the evolution of numerous sophisticated concepts and diagnostic/therapeutic tools, many of which are powerful models for complexity-applied medicine. They include, but are not limited, to individualized treatments, diagnosis by patterns (e.g., whole-systems medicine, homeopathy), elaboration of networks and localized hubs (e.g., acupuncture points on meridians, connective tissue network), synergy (e.g., herbs), health defined as a state of balance, treatment combinations across different factors (e.g., chemical, behavioral, energetic, spiritual), the importance of the practitioner–patient interaction in healing, fractal patterns within the body (e.g., reflexology, auricular acupuncture), and the use of minimal interventions to affect the larger system (e.g., acupuncture and homeopathy).

Moreover, the significance placed on dynamic interactions and whole systems has led CAM therapies to appreciate physiologic processes that are frequently overlooked. These processes include interactions between the mind and body; electromagnetic field effects on human physiology, connective tissue, and musculoskeletal networks; the influence of nutrition and environment on gene expression; and the importance of social networks on health, among others. As conventional medicine progressively adopts a systems-based perspective, these processes may be increasingly recognized as important and, in some cases, critical for establishing good health. If this occurs, the lessons learned through CAM research and practice can provide a rich foundation for further investigation and understanding.

Finally, in research, CAM may provide valuable insights to scientists interested in incorporating complexity science into medical research. CAM researchers frequently struggle with issues related to working across differing paradigms or perspectives. Researchers wrestle with applying systems-based therapies to reductionistically defined diagnoses, with using qualitative outcomes in quantitative statistical analyses, and with using individualized approaches despite the need for identifying generalizable interventions. The need to straddle these separate worlds is leading researchers to develop translational tools capable of working with one perspective while remaining true to another. Manualised protocols and techniques for validating qualitative outcomes are two examples. The challenges encountered with CAM research will similarly confront complexity scientists as integrating information across reductionist and systems-based disciplines becomes increasingly important.

Because CAM and complexity science share similar orientations and challenges, the insights and lessons learned from one will be likely to benefit the other. Ultimately, the clinical setting is where theory meets reality, and, in this respect, CAM is well positioned to provide the human-level perspectives for a complexity-applied medicine.

As a system of practice that values dynamic interactions and systems-based thinking, CAM is poised to provide the conceptual models and techniques that embody practical applications of complexity science to medicine. Conversely, complexity science can yield important analytical

insights into the diagnostic and therapeutic approaches of CAM. The level at which CAM and complexity science interact will depend on the actions taken by the CAM community within the next 5–10 years.”

Biomedicine and CAM using different models

A comparison of holistic and biomedical approach could give a misleading impression that there are just differences in the technology and instruments used. The essential difference however lies in the underlying paradigms, attitudes, and values. CAM is not solely a set of clinical interventions, it is a broad social movement that expresses a need to recast the meaning of health and disease. Factors underlying the increased popularity of CAM include the rise in prevalence of chronic diseases, an increase in public access to health information world-wide, reduced tolerance for paternalism, an increased sense of entitlement to quality of life, declining faith that scientific breakthroughs will have relevance for the personal management of the disease, increased sense of personal responsibility for health and health care, concern about the side effects of ever more potent drugs, and an increased interest and understanding that health involves a positive balance of all aspects of an individual's life from the physical through the mental and emotional to the spiritual.

1. The biomedical model

Western medicine is based on a specific – biomedical – model which is so deeply interwoven within our society and healthcare system that it may be forgotten that it is but one way of thinking; one of many perspectives. The biomedical model concentrates only on somatic aspects: the body is considered as an object, a complex machine. It narrowly focuses on pathological anatomy and patho-physiology and de-emphasizes overall wellness and welfare. Illness results from biochemical or localised tissue disruption or specific pathogen; disease is considered as an abnormal entity in the body. The treatment consists of combating disease by repairing, neutralising, or intervening in pathological process with the aid of chemical substances (drugs) or surgery, and is as much standardised as possible (treatment protocols and guidelines). The physician is primarily responsible, whereas the patient is a passive recipient of treatment, although compliance is expected.

2. The holistic model of Complementary and Alternative Medicine

In the holistic CAM model human beings are considered as adaptable, self-regulating, creative biological systems. Illness/disease is a disturbed life process with causes at physical, emotional, social, mental, spiritual levels. Patients themselves take the responsibility for their mental and physical health. Treatment involves mobilising and stimulating self-regulating capacity, restoring the balance in the psychosomatic system with the eventual aim: creating and maintaining the health and wellbeing and reinforcing the autonomy and resilience of the patient. Care is individualized and the responsibility lies with both the health professional and the patient. CAM therapies are not specifically directed at attacking the symptoms or the immediate underlying pathology, but at reinforcing the resilience, resistance and immune system, at raising the level of overall health and thus pushing back the disease state. Improving the level of health implies reducing the susceptibility to illness and disease as well as addressing any already existing disease process. As such CAM approaches are not limited to simply addressing certain diseases but are universally applicable to patients suffering or threatened by all kinds of diseases. They can often be used as early first therapeutic options, thus greatly reducing the need for high-impact, high-cost interventions with potential adverse effects and for long-term dependency on conventional medication. In case of infectious

diseases CAM modalities, by their capacity to boost the immune system, can reduce the need for antibiotics¹, thus as well as the problem of microbial resistance.

The current state of affairs in CAM research

As to the effectiveness of CAM therapies, observational studies in thousands of patients show consistent positive results in 40-70% of them as regards presenting disease symptoms, overall wellbeing and reducing the use of conventional medication (Busato et al., 2006; Hamre et al., 2010; Jeschke et al., 2010; Sharples et al., 2003; Spence et al., 2005; Witt et al., 2005). The majority of these patients have chronic conditions, many have multiple pathologies and many have not responded to previous conventional treatment. There is also some evidence demonstrating that some CAM treatments can be as effective as or even more effective than conventional treatments, with hardly any adverse effects and with greater patient satisfaction (Güthlin et al., 2004; Marian et al., 2008, Riley et al., 2001, Sharples et al., 2003; Spence et al., 2005, Witt et al., 2008).

More rigorous research projects of the highest scientific standards have been conducted and published in leading medical journals over the last few decades. Some studies demonstrate that the quality of scientific research in CAM is, according to current standards, at least as good as in conventional medicine (Lawson et al., 2005; Klassen et al., 2005). Classical randomised controlled trials (RCTs) using standardised interventions are widely accepted as the gold standard for answering questions of efficacy, but they have major limitations, especially when applied to the study of CAM whole systems and the individualized treatment approach that is typical for CAM. Still, within these limitations a number of RCTs have been conducted and have provided evidence for the effectiveness of several CAM modalities. A comprehensive review of the CAM evidence base falls outside the scope of this document, but a review of 145 Cochrane reviews of CAM modalities (Bondurant et al., 2005) revealed that 24.8% of these reviews demonstrated a positive effect, 12.4% a possibly positive effect, 4.8% no effect, 0.69% a detrimental effect, whereas 56.6% of the reviews were classified as insufficient evidence of an effect.

Although the total amount of research in CAM is far less than in conventional medicine, also in conventional medicine most decisions about treatments rest on the individual judgments of clinicians and patients rather than external evidence. The BMJ Clinical Evidence website² shows that 11% of conventional medical treatments are beneficial, 23% are likely to be beneficial, whereas the effectiveness of 51% is unknown.

The quantity and quality of cost-effectiveness research in CAM has increased over the last few years, although the total number of studies is still limited. Some studies have revealed promising indications for cost-savings by an extended use of CAM therapies in comparison with conventional treatment (Herman et al., 2005; Maxion-Bergemann et al., 2006; Hollinghurst et al., 2008; Pelletier et al., 2010). A recent example is a Dutch study including 150,000 individuals (Kooreman & Baars, 2011), which demonstrated that patients whose GP has additional training in homeopathy, acupuncture or anthroposophic medicine had substantially lower health care costs and lower mortality rates. The lower costs result from fewer hospital stays and fewer prescription drugs.

² <http://clinicalevidence.bmj.com/cweb/about/knowledge.jsp>

The need for more CAM research

Although about half of the general population in Europe uses CAM, there is still a negligible amount of funding for research in this area by the European Union and EU Member States. Funding by the industry is limited by the fact that CAM medicinal products are generic and cannot be patented; thus there are no large profits to be made from investments in research as for many new conventional prescription drugs.

Ernst (1996) calculated that 0.08% of the British National Health Service research budget went towards CAM research. Even though recent initiatives in a few European countries, including Denmark, Germany, Norway, the Netherlands and the United Kingdom, have specifically freed up some funds for CAM research, these amounts are minute compared with funding in other areas of medicine.

The current limited research infrastructure and experience in the field of CAM greatly hampers competition with conventional medical research proposals. The situation could best be changed if 'ring-fenced' funds, i.e. money especially dedicated for the purpose of CAM research, were generated. This way high-quality researchers can be attracted and a research infrastructure can be developed, which reflects the actual prevalence and relevance of CAM.

The need for appropriate CAM research methodology

A majority of CAM research to date has used the research strategy employed and developed by clinical pharmacologists to document, in a prescribed sequential pattern, the quality, dose, safety, efficacy, and eventual effectiveness of a drug prior to its general release (Fønnebø et al., 2007), or, more generally, to evaluate the effectiveness of a single standardized component of care on a specific set of outcomes. Randomised controlled trials (RCTs) are seen as the gold standard. The underlying philosophy of RCTs is to determine a single best treatment for all patients suffering from a certain disease, rather than individualisation of treatments to particular patients.

As shown in sections above, CAM includes whole systems of healthcare in which practitioners apply bodies of knowledge and associated practices in order to maximise the patients' capacity to achieve mental and physical balance and restore their own health, using individualised, non-reductionist approaches to diagnosis and treatment (Ritenbaugh et al., 2003). The processes and the outcomes of complex health care interventions are encompassed by whole systems research. This type of research entails the intention to include conceptually as part of the investigative context all aspects of any internally consistent approach to treatment, including its philosophical basis, patients, practitioners, setting of practice, and methods/materials used.

Fønnebø et al. (2007) conclude: *“If CAM is to be evaluated comprehensively, one needs to extend the research focus to all aspects of the treatment approach. [...] Plunging into studies of efficacy that involve isolated detailed components of a treatment approach without thoroughly understanding its context is destined to failure and irrelevance no matter what the results show. These issues point to the need for a different, and more complex, research strategy for the CAM field”. [...] Patients are seeking CAM as a treatment system. Research needs to examine the outcomes of these treatments both in combination with, and as alternative, to conventional care. [...] Randomized controlled trials should only be considered after we have a better understanding of the processes and outcomes of whole*

systems and well-designed observational studies have been completed. [...] [R]andomized, controlled pragmatic trials are needed, wherein the specifics of the system are not disassembled, but the system under study is allowed to function as it is clinically practiced, including the urgently needed evaluation of cost-effectiveness.”

Benefits for the EU Community of research into CAM

Currently there is no coordinated approach to research into CAM. Furthermore, and significantly, there has been insufficient research funding from any sector to support more and larger studies into CAM. As a result there are insufficient studies of sufficient size and power to provide sufficient reliably generalisable results. Large-scale studies of CAM's potential to maintain health and prevent illness are lacking. Studies into cost-effectiveness and models of integration of CAM with existing healthcare provision are also lacking. Building on the existing evidence of positive effect on health promotion and contribution to the major public health priorities is lacking. There are also serious methodological challenges that continue to inhibit the appropriate study of the complex interventions of CAM. Until now, partnerships between the various CAM stakeholders, providers, users, health system managers, health and research policy makers, researchers and product producers are almost non-existent.

So, while the individual citizen demand for CAM is steadily growing, the evidence base for policy and service provision lags far behind. The critical area where our experience and, the limited amount of research compared to conventional medicine, suggests research into CAM offers the greatest added value, is in public health via its inherent focus on strengthening individual health and thereby combating health threats, the promotion of health, and safer and more cost effective treatment of chronic illness. Specifically, we would like to suggest the following:

1. Partnerships and research methodology.

In order to ensure value and subsequent practical application from research into CAM's contribution to the Community's health strategy, initial research on how to build mutually beneficial partnerships and the development of appropriate CAM research methodology is required.

2. Health maintenance and prevention.

Following the development of partnerships and appropriate methodologies, research into CAM's contribution to health maintenance, illness prevention and health literacy both on its own and integrated within existing public health systems is more assured to provide evidence for practical application.

Modern prevention within the biomedical model is especially concerned with the identification of risk factors. Risk is understood as a composite of impersonal 'factors' e.g. viruses increasing the possibility of an illness. These factors are pinned down in relation to statistically derived norms.

The holistic model of health and disease places a far greater emphasis on building and maintaining the resilience and resistance of the host so as to be able to respond effectively to the existing risk factors. In support of this understanding, responsibility for health

maintenance and for treatment of ill-health involves a significant shift in the balance of active responsibility from the provider to the patient. The provider's role is to get the patient more actively involved in managing his or her health and preventing, treating or managing disease while also supporting them with appropriate whole system interventions that support resilience and resistance. The concept of self-care requires a daily conscious focus on one's physical, mental, and emotional state and the ability to take corrective action whenever imbalance is sensed. According to Rosenman (1997), it appears prudent to pay increased attention to the individual who possesses a risk factor, and not the risk factor per se.

How to inspire, motivate, empower, and facilitate patient self-care is an important issue in a health-oriented healthcare system. Self-care is a two dimensional construct that includes processes for health in self-care practice and action capabilities. The processes include life experience, learning processes, and ecological processes. Action capabilities include power and performance capabilities. The primary aim of inspiring, motivating, and empowering patients is towards a single goal—being able to bring about a positive behaviour change. Several models have been developed to address behaviour change. A common theme that emerges from a critical evaluation of all these models is that a planned intervention should ideally incorporate several essential components for successful behaviour change. The two steps in this process involve assessment and action. Components of assessment include ascertaining the need for behaviour change, resources, individual perception of need for change, and self-efficacy. Most of these models were developed to address a specific medical condition. There exists a need to test behaviour change models within the context of multiple complex health conditions that is representative of the patient population today.

There is a fundamental difference between a science that studies diseases and a science which studies health: the questions, hypotheses, methods and answers and conclusions will be different. For instance, research into the mechanisms and factors of how smoking may lead to lung cancer is very different from the research that tries to find out why many smokers do not get lung cancer. Current medical research is typically interested in the way disease processes develop and focused on how to improve ways to fight disease with the aid of ever more powerful drugs. However, host factors, which are one of the three variables in the triangle of disease causation (agent, host, and environment), remain sub-optimally addressed. The concept of positive health, or salutogenesis, focuses on how and why people stay well; it highlights the inadequacy of pathogenic explanatory factors and concentrates on the adaptive coping mechanisms underscoring the movement to the healthy end of the 'ease-dis-ease' spectrum. It is within this context that it is important to understand that the majority of CAM interventions are targeted at supporting the adaptive coping mechanisms of the host rather than addressing specific diseases and dealing with impersonal risk factors.

Research is needed to enhance understanding of resilience factors that protect an individual from developing physical and emotional illness in the face of stress and other pathogenic factors, to identify optimal strategies in developing resilience within healthcare, and to identify social factors that can be modified to support resilience to promote public health. Integrated models for behavioural change need to be developed and tested to motivate patients with multiple complex health problems for a sustained change in behaviour. Research into designing and testing resilience interventions incorporating the wisdom of complementary and alternative healing systems and further understanding the neurobiology of resilience has the potential to transform patient care. There is already a small but growing body of research that uses conventional measuring techniques to show the impact of specific CAM interventions on the human and animal physiology. This needs to be built on.

3. Chronic disease and health service delivery.

A further strand of most benefit would be the contribution of CAM in the treatment of chronic illness, the potential of more cost effective treatment, the reconfiguration of health service staff training and service delivery, its impact on healthy ageing, and treatment of conditions of high cost through lost social and industrial productivity, e.g. musculo-skeletal injuries and conditions are a primary cause of absenteeism, loss of productivity and health system for which there is already evidence of cost-effective treatment by CAM modalities. *We suggest that there be funding for study of the integration of CAM and conventional medical care for such conditions that includes evaluation of the impacts on personal health, productivity and cost effectiveness.*

Given the large number of research areas that need to be addressed and the limited resources, a systematic approach to prioritizing projects is needed. Priority should be given to conditions and diseases that impose a heavy burden of suffering to patients and costs to society for which current therapies are insufficient and for which CAM approaches offer a reasonable likelihood of being helpful and are already in use.

Outcome measures should include not only traditional measures of morbidity, mortality, cost of care, and patient satisfaction, but also the impact of care on individual resilience, coping, and self-efficacy while also measuring the impact of the individual's improved well-being on factors such as family and social cohesiveness. The impact on the environment also should be considered. Additional outcome measures may need to be developed to address the concept of health as optimal functioning rather than as the absence of disease and to address patient priorities, particularly when there are multiple co-existing priorities. Additionally, the impact of health at work and a healthy work-life balance should be considered.

It is in this area that there is perhaps the greatest potential for collaborative innovation between CAM providers, conventional health services, small and medium-sized enterprises (SMEs), and service users. Funding to establish such collaborations has the capacity to practically demonstrate the transformation of service delivery and the cost of delivery.

4. Health Inequalities.

A major objective of the current EU health programme is to reduce health inequalities. The benefits that motivate use of CAM are currently available mainly to those with private means to address their own healthcare because it is extremely rare to find CAM modalities offered within State healthcare systems. *We suggest that there is enormous potential to establish monitored coordinated pilot projects throughout the Community to assess the contribution of CAM to reducing health inequalities with relatively low cost projects that have a focus on developing health literacy, and health maintenance.* The health programme as currently structured would not appear to be able to facilitate this. In an environment of economic cutbacks, severe staff strain to deliver more with less, the vision to embark on such projects is unlikely to be available or fostered locally. EU inspired and supported action is necessary.

5. Contribution of CAM professionals.

The current health programme speaks of the need to improve capacity in public health systems. This includes “ the development of public health professionals as well as the development of public health skills and knowledge of those who are not fulltime public health professionals....(including other health professionals..)”

It is acknowledged now that there is a drain and a recruitment strain on medical professionals in Europe. At the same time there is in the order of 300,000 to 400,000 professionals working with CAM mostly outside of official healthcare systems in private practice. Here, there is a significant untapped resource that can contribute to public health programmes on health determinants, healthy ageing and health information. They can contribute their unique knowledge and skills through integration into existing or new public health programmes, and, through contributing to the education of existing health professionals in the public health area. *We suggest therefore that there be inclusion of funding to pilot and test these contributions.*

Conclusion

The ever increasing health care expenditure, the increasing prevalence of chronic diseases and failure of effectively managing them, the huge burden of adverse side effects and mortality due to the toxicity of prescription drugs, and the growing resistance to antibiotics can only be remedied by shifting our focus from our attempts to defeat disease to the promotion of health and prevention. In this context health is not seen as what is 'left over' when a person is free of all disease symptoms and obviously predisposing factors to disease, but rather the successful dealing which disturbances to homeostasis. That also means that the current focus of medical research on studying diseases and the consequent effect of therapeutic methods upon them should shift to the study of health promotion, salutogenesis and resilience.

Complementary and Alternative Medicine with its fundamentally supportive nature and its potential to humanise modern medicine and widen its vision beyond disease to health and wellbeing, has a substantial role to play when it comes to restoring the patients' own natural systems for fighting disease and maintaining health with the aid of natural medicines, modification of lifestyle, dietary change and health psychology approaches. CAM is also empowering because it encourages people to use and to recognise their own self-healing abilities and to develop more active approaches to life beyond the classic active/passive relationship of the biomedical encounter.

In accordance with the potential of CAM to respond effectively to the ever-increasing prevalence of chronic disease as well as its widespread demand for CAM among European citizens, research funding in this area by the European Union should have a high priority. Research in CAM should not just investigate the efficacy of a complementary set of instruments in the medical bag. Research on the role of CAM in wellness and health promotion, the application of CAM principles and practices, the mechanisms of action of individual CAM therapies, including patterns of response to treatment, and the role of CAM health professionals in the management of chronic disease should be expanded. New and innovative CAM research is necessary on core questions posed by frontier areas of scientific study associated with CAM that might expand our understanding of health, illness/disease, healing and mechanisms facilitating self-healing.

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