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UCLPartners AHSC champions 4P Medicine

Victor Dzau[1] and we[2] have argued that academic health 'systems' must evolve to rise to the contemporary challenge of non-communicable 'chronic diseases' (NCDs) that reflect the ageing of the population and the impact of the adverse lifestyles. Academic Medical Centres (AMCs) have contributed enormously to the development of technological solutions to acute illness and advance stage consequences of chronic diseases but if the rising tide of NCDs is to be addressed and the focus of the NHS move from a disease service to a health maintenance service, prevention needs to be recognised as the 21st Century challenge.

Public health measures that result in a better environment and advantageous health-related behaviours are crucial, but scientific advance creates increasing opportunity for *preemptive* medicine: interventions that interrupt the biological mechanisms responsible for disease before it is manifest. Of course a lot of the reduction in cardiovascular mortality in recent years reflects the impact of such measures to control cardiovascular risk factors but the same approach can be adopted for example for pain control, enhancing resilience in those at risk of mental illness, delaying the complications of diabetes and in the future reducing the prevalence of dementia. Such approaches require the academic and clinical expertise found in AMCs in order that they can be developed, applied and evaluated effectively. To fulfil such a role the other '3Ps' of 4P medicine[3] are key: *prediction* - sophisticated systems, genomic and phenotypic to pick up the earliest predictors of risk; *personalisation* - tailoring the preemptive approach to the individual's biological make-up, lifestyle and health beliefs; and fundamentally *participatory* - recognising that for citizens to engage in and adhere to such approaches that may require decades of 'treatment' to achieve the aims, they must own the concept and the locus of control shift to them.

In the UK (and in the US for different reasons) the health system is not ideally configured to enable specialist centres to play such key roles in health maintenance. UK hospitals are incentivised to treat people in hospital rather than prevent that need and vertical service integration remains a challenge. But if we wish to cut disease prevalence we must harness the full power of our constituent universities to address the 4P challenge and ensure our specialist centres can engage with populations at risk. Our six AMCs provide such an opportunity - and the newest - cancer and cardiac enable us to consider building in such an approach from the beginning.

[1] Dzau VJ, Cho A, Ellaissi W, Yoediono Z, Sangvai D, Shah B, Zaas D, Udayakumar K (2013) Transforming academic health centers for an uncertain future, *N Engl J Med*, 369(11):991-3.

[2] Tooke J and Jacobs I (2010) Academic health science systems, *The Lancet*, *375*(9728), 1781-1782.

[3] National Institutes of Health (2011) Strategic Vision for the Future, http://www.nih.gov/strategicvision.htm